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MOTOR AGE

Finding a Home for the City Man's Car

By Darwin S. Hatch

FOR the man of moderate means who is an owner or a prospective owner of a motor car the garaging of the car is of almost as much importance as the choice of the car itself. Yet it is often the case that this feature receives very scant consideration until the motorist finds himself the possessor of a new car with no place to keep it. Then he wonders what he will do with it.

The problem of proper garage facilities is by no means a small one in the country and little towns, but in the city, where a large proportion of less wealthy motorists live in rented apartments, the question is a formidable one. Of course, many flat dwellers who own cars avail themselves of the public garages — always an expensive and often an inconvenient arrangement. This is practically the only solution, unless, as is becoming more and more frequently the case, small private garages are built on the premises and included with the apartments in the lease, or the motorist is lucky enough to arrange with a more fortunate neighbor for space in his garage.

When the motorist owns his home he will find a private garage not only less expensive in the long run but it will give him an opportunity to make minor repairs and adjustments whenever necessary if he is mechanically inclined. The garage need be limited in size and equipment only by the size of his pocketbook or the dimensions of the lot. It may range from the little frame shed built at a cost of less than $25 and with barely room enough for one small car to the elaborate two-story building designed by an architect to house not only several motor cars but a corps of chauffeurs and mechanics with a repair shop in miniature as well. But it is not for Mr. Croesus that this is written but for the man who has a car of medium price and wishes to house it in his own garage.

For such a man—that is, the average motorist—a private garage large enough for one car, with the necessary equipment for all ordinary repairs, can be built and maintained without excessive tax on the pocketbook. A frame building about 12 by 18 feet in size with a cement floor can be built for less than $125 and will provide sufficient room to work around the car and for a modest equipment. By increasing the cost either cement or brick construction can be had, making the garage easier to heat and providing better protection from freezing in case no heating arrangements are provided.

"What Shall I Do With It, Now That I've Got It?" Is the Question the New Owner Asks Himself—Problem of Securing Proper Garage Facilities a Serious One to Metropolitan Motorists Who Do Not Patronize Public Establishments—Many Clever Ideas

Private Garage Can Be Built for $25 but Generally This Small a Building Hardly Suffices—Frame Structures Not Desirable Because of Danger of Fire, Concrete Being Most Favored—Various Styles of Storage Facilities for Motor Cars Described and Discussed

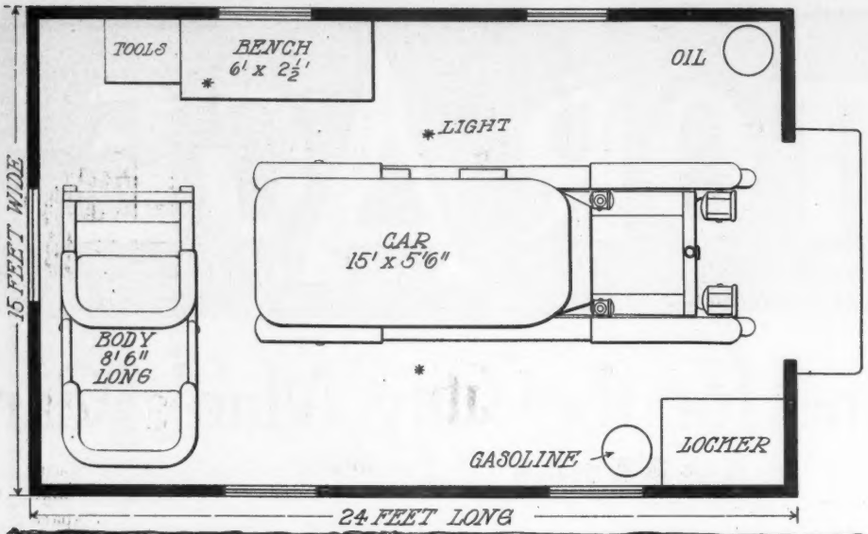


Fig. 1—Floor plan of an inexpensive garage for one car. In a building 24 feet long by 15 feet wide is plenty of room for a medium sized car, a work bench, locker and tanks as well as space for the body

For the substantial reason that the frame garage is not fireproof and from the nature of the materials stored frame construction is not to be recommended, except on account of its cheapness. The most satisfactory material for garage construction on the whole is concrete, either as plain mass concrete or reinforced concrete, or in the form of blocks or hollow tile. Concrete blocks are much in favor and are used either in solid, hollow or two-piece blocks. The solid blocks usually must be furred and lathed on the inside to prevent the seepage of water.

A point that often is neglected when deciding on the size of the garage is the provision of space for the body after it is removed from the chassis. A little greater length or width, where the body may be placed, often will add greatly to the convenience of work around the car without increasing the expense of construction very much. In the two floor plans, Fig. 1 and Fig. 2, are shown two arrangements for garages which may be constructed at a cost of between $100 and $200 and which will be large enough to house a car with a modest equipment of tools and supplies as well as providing extra space for the dismounted body to be set aside for repairs on the chassis.

Makes Money Out of Garage

One owner of a medium price car solved the storage problem in a way that allowed the garage to become a source of revenue instead of an item of expense, as is usually the case. At a cost of about $1,000 he built a brick garage 45 by 22 feet in size, which affords plenty of room for four cars besides a work bench and lockers. The extra space is taken by three of his neighbors, who are very glad to pay the $20 per month rental. Each renter has a locker in which are kept the oil, spare tires and other supplies for his car. A gasoline storage tank outside the building is filled by the owner, the renters taking fuel from this common supply and keeping tally on a paper tacked on the door to be settled at the end of the month.

A garage for the car of the flat-dweller. In connection with apartment buildings garages are provided for housing the tenants' cars. The second story of this building was ren ed as a residence

Horse Is Remembered

It is sometimes desired, especially by physicians, to make provision for a horse and buggy or carriage, as well as for the car. Usually this is done by remodeling the barn, but in other cases the garage is designed to house the horse-drawn rig. One inexpensive arrangement of this kind is a garage 30 by 18 feet in size with a box stall for the horse in one corner, leaving space for two cars or one car and a carriage. This building costs about $100 and is equipped with electric lights and city water. No provision for gasoline storage is made, as the fuel is obtained as needed from a local supply station.

One of the most convenient arrangements for the motorist who does not care to build a permanent garage is by the use of the portable garage. These are either of steel or wood and are designed to be readily set up or dismantled. They cost between $100 and $200, depending on the size, and have found favor with many as permanent garages.

Cement Floor Is Needed

A cement floor should be provided as a protection against fire no matter what material goes into the construction of the building. It is well to have a drain in the middle of the floor with a grating over it and the floor slanting toward it to provide an exit for the grease and oil that is sure to be spilled and to permit of the washing of the car. Before the floor is laid the location of the work bench and other fixtures should be decided upon so that blocks of wood may be imbedded in the cement for anchoring them.

The most important part of the equipment of the garage is the work bench. This should be very strongly built and must be firmly secured to the floor and to the wall. It need not be over 6 feet long or 2 feet wide, but a foot more each way will make it more convenient, for then there is room for a small rack to hold the many small pieces that always accumulate. It should be provided with a small shelf underneath and with a 4 or 6-inch vise. A locker or cupboard should be placed on the wall near the bench and should be divided into compartments or pigeonholes for nuts, bolts and the smaller tools. The latter should include large and small screwdrivers, an assortment of files, hammer, pipe wrench and monkeywrench, tin shears and a scraper for the bearings.

Other Necessities

A soldering outfit is almost indispensable and should contain solder and soldering acid, blow torch and soldering iron. A set of standard taps and dies as well

as a breast drill and a set of drills should be included. A vulcanizing outfit is not really necessary, but will be found very useful. If electric power is available the vulcanizer should be electrically heated, on account of the convenience. Whether or not a vulcanizer is provided, the tire repair outfit should include rubber patches, cement and emery cloth and a wire brush for cleaning the damaged portion of the tire.

Sponges and chamois skins are, of course, necessary for washing the car. A good jack is needed and a set of tire savers for taking the weight of the car off the tires when the machine is laid up for any length of time. Where electric lights are used it will be found a great saving of time and temper to install a small motor-driven tire pump. On a shelf along one wall can be kept the motor oil, grease, kerosene and spare tires.

Luxuries in Tool Equipment

The equipment mentioned is all that is necessary for the every-day care of the car, but if the motorist wants a slightly more elaborate establishment in which all repairs may be made a few power-driven tools should be included. These should comprise a small lathe and emery wheel arranged to be driven by an electric motor. A motor of 1 horsepower would be ample for these tools. It can be placed on the floor, but a better way is to bolt it to the wall or ceiling, where it will be out of the way and less liable to accumulate dust and dirt. A blacksmith's outfit consisting of a forge, anvil, sledge hammer and tongs will complete an equipment that will make the motorist practically independent of the repairman.

Whenever possible arrangements should be made for heating the garage, especially if the car is to be used to any extent during the winter months. Not only is the starting of the car made much easier but the comfort in cleaning and making adjustments is so much greater that the expense entailed is usually more than compensated for. It is unfortunate that the presence of the inflammable gasoline introduces difficulties in the way of heating a small garage and many motorists have been led to dodge the issue by placing a stove inside the building—often to their sorrow. The fact that the vapor of gasoline is much heavier than air prevents its rising and passing out of the building and it creeps along the floor and collects in remote corners, eventually finding the stove.

Heating the Garage

The ideal way of heating the building, and the one usually adopted in the city, is to supply steam or hot water from the heating system of the house. When this is impossible, the only safe method is to install a small heater outside the garage or a stove having a hood which is connected to air flues inside the building.

There are only two safe ways of lighting the garage. One is sunlight and the other is by electric light, and the latter has been known to lead to an explosion when the insulation of the wires was bad or the switches were exposed. Electricity is by far the best artificial illuminant. Not only is it the safest but the electric current can be used for vulcanizers, tire pumps, etc., to lessen the work of caring for the car. The bulbs should be protected by wire guards and in addition to the lamps for general illumination one or two drop cords long enough to reach any part of the car should be hung from the ceiling for close work around the motor.

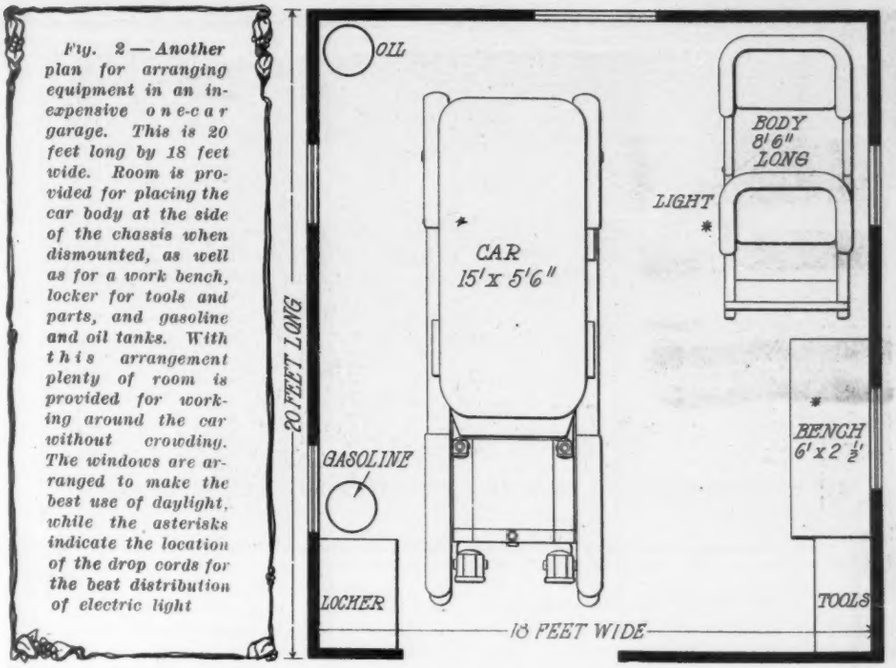
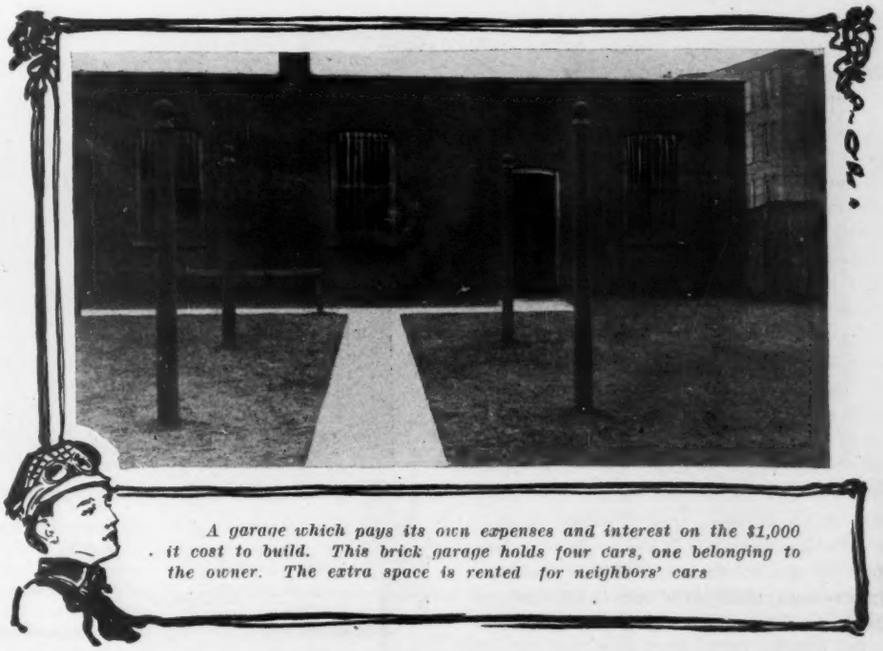


Fig. 2—Another plan for arranging equipment in an inexpensive one-car garage. This is 20 feet long by 18 feet wide. Room is provided for placing the car body at the side of the chassis when dismounted, as well as for a work bench, locker for tools and parts, and gasoline and oil tanks. With this arrangement plenty of room is provided for working around the car without crowding. The windows are arranged to make the best use of daylight, while the asterisks indicate the location of the drop cords for the best distribution of electric light

Storing the Gasoline

A very large proportion of motorists makes no attempt to keep any more gasoline on hand than that which is contained in the tank of the car. By obtaining it as needed from a nearby supply depot they do away with the necessity of making special arrangements for storing the fuel in quantity. This method has two drawbacks; one is that the cost is usually greater when purchased at retail and the other is that they sometimes find but an empty tank, necessitating a hurried trip to the supply station. Where the fuel is to be kept on hand it must be stored either under the floor of the garage or outside the building. Outside storage often is provided by a tank in a covered shed just large enough to hold it. Much the better method of storage, however, is in a tank buried in the ground with its top about 2 feet below the surface. The gasoline is thus kept at a constant temperature and the loss by evaporation is as low as possible. The use of an underground tank makes a pump necessary for drawing off the gasoline.

The cost of storing the car in a public



A garage which pays its own expenses and interest on the $1,000 it cost to build. This brick garage holds four cars, one belonging to the owner. The extra space is rented for neighbors' cars

When the motor car drives out the horse. An old barn used as a garage without any attempts toward remodeling. The installation of a work bench and an oil tank were the only changes made here. A sliding door to replace the old swinging doors, now in use, would be more convenient

garage varies in different cities and even in any given city the rates are subject to considerable variation in different localities. The average monthly charge for storage in the city is probably between $15 and $20, although in many cases it runs up as high as $35 and $40 for large cars in exclusive neighborhoods. These figures include the daily washing and polishing of the car, but there is the so-called live storage when the car is merely given space in the garage at the rate of about $10 per month and no attention paid to it. The cheapest rate of storage is the $3 to $5 a month charged for dead storage when the car is not in regular service. An extra fee of from $1 to $2 is charged each time the car leaves the garage. Where the car is kept at a public garage there is no opportunity to store supplies and the motorist cannot take advantage of wholesale rates.

Chance For Amateur Repairman

It is not alone the economy of keeping a car in a private garage as against the cost of public garaging that makes the balance in its favor, nor is it solely the convenience of always having a car at the back door whenever it is wanted that makes a private garage advisable whenever it is possible to have one, but there is another reason and one which has an overwhelming influence with the really enthusiastic motorist. Every owner of a car has to some extent the same feelings with regard to it as does the owner of a fine horse, and many owners, when given the opportunity, exhibit the same fondness for the little attentions and daily care of the machine that is bestowed upon a favorite mount. With a great many men of moderate incomes the desire to tinker with their own car is one of the chief reasons for possessing one, and while indiscriminate tinkering with a motor car is not to be encouraged, yet intelligent and painstaking daily adjustment will always lengthen the life and increase the service of a car, as well as make the owner much more careful in driving it. A man who takes personal care of his horse is very sure to never overtax its strength or endurance; nor is the man who learns to appreciate the capabilities of a car, by attending to its ailments himself, liable to ask more of it than it can reasonably perform. It is a self-evident fact that this daily care cannot be given a car that is stabled in a public garage, perhaps many blocks from the owner's home, and where there is in all probability no place to keep his own tools or do his own work undisturbed. In fact, in many of the public garages a rule is strictly enforced that when the owner or his representative does any work in the line of repairing or cleaning a car a member of the garage force must work with him—naturally on the owner's time.

Hints For Owner

If a private garage is built for the car, arrangements should always be made for plenty of space not only for the necessary tools, spare parts and supplies, but also for such equipment as a work bench, lockers, etc., so that really good work can be done. Further, plenty of space should be left for getting on all sides of the car without soiling the clothes unnecessarily. If the building is well lighted much better care will probably be given the car, for very little work of the delicate nature usually required can be accomplished in the semi-darkness of an oil lantern. This lighting feature is one which is of perhaps more importance to the average man who spends his daylight hours at his regular occupation and has only his evenings for what to most men is the recreation of puttering around a car. The question of heating a garage is of just as much importance as the lighting question. Perhaps the reasons most potent in the consideration of motorists in general for heating a garage are the dangers of freezing and that the motor is very hard to start when cold; but the latter difficulty can usually be overcome in any of several ways. The most unique and one of the most efficient methods is to wrap a hot water bag around the carbureter. The freezing of the water in the cooling system can usually be prevented by hanging a lighted lantern near the radiator, although this method cannot be recommended from the standpoint of safety, for if there is any leakage of gasoline from the car the explosive vapor is apt to reach the flame of the lantern in course of time.

A reason for keeping the garage well heated which is of greatest weight to many motorists is the opportunity it gives

Where a brick barn can be found in good condition a cement floor is usually all that is needed to make an excellent garage for one car. There is usually room for all the necessary equipment. This building will house three cars very conveniently and will leave room for working

them to work around the car in the winter time, when outdoor work is impossible. One motorist whose income was too slender to allow of his purchasing a car of a new model this spring, devoted his spare evenings during the past winter in converting his runabout into a natty four-passenger car of the fore-door type, much to the improvement of its appearance and the perfect satisfaction of his family. To do this work at such a time obviously would have been an impossibility without good means of both heating and lighting his garage.

Hardly worthy the name of garage. One of the least expensive of the many methods of housing a motor car at home. No heating arrangements are provided as the car is rarely used in winter, while a lantern furnishes the light for the little repairing that is done at night

How Not to Do It

A certain amount of common sense and intelligence should be exhibited in the construction or selection of a place to house the motor car and should be given consideration in proportion to the value of the car; yet there are many cases in which a motor car costing several thousand dollars is entrusted to the protection of some flimsily built shack while a $100 horse is housed in a stable costing $2,000 or $3,000. Very few motorists realize the necessity of cleanliness in a shop or garage where repairs are to be made on the car. Very often a crankshaft or valve or piston will be found lying on a bench where emery dust, steel filings or any of the other materials which should never get into the wearing parts of the car find free access to them, and when the parts are replaced without careful cleansing the owner wonders why the bearings wear or the motor loses compression or many other ailments beset it. An aggravated instance of this kind may be mentioned as a warning and a good example of how not to house the car. A new motor car costing in the neighborhood of $2,000 was found in a small frame shed, barely large enough to hold the car comfortably, and yet a bench with three legs wobbled further and further into the oil- and water-soaked dirt floor with each blow of the hammer. In one corner were stacked, in a state of precarious stability, grease cans, empty and full, and boxes of assorted rusty nuts and bolts, upon the top of which was thrown a discarded tire or two. In another corner a galvanized iron tank with a hole in the top and containing gasoline added its quota to the fire hazard, while a pile of oily waste lurked nearby. The car stood with two of the wheels in a puddle of oil, mixed with water that had leaked in through holes in the roof, while one of the others was resting on a broken glass bottle. The engine had been partially disassembled and one of the pistons was lying upon the bench, while sand from a neighboring excavation blew in every time the sagging door blew open with the wind. Further ventilation was afforded by a broken pane of glass in the window, while a smoky oil lantern hung by a string from the ceiling comprised the lighting and heating facilities. When asked the reason for the lack of proper garage for a comparatively expensive car the owner protested that it required so much more repairing than did his neighbors' cars, which were housed in better garages, that he could not afford to spend more money on it. It seemed useless to point out that a cement floor and patches on the roof would probably cut his tire bills in two, while a thorough house-cleaning and repair of the building would materially decrease his other repair bills.

The washing of the car can very often be carried on outside of the garage, especially if there is a cinder driveway. It is best, however, to make provision for washing the car within the building by a tap from the house supply.

A way to provide stable room for a horse in the garage. One corner was partitioned off to form a box stall, while the rest of the space was devoted to the motor car and its appurtenances. A cement floor of this garage slopes toward a drain in the middle

Keeping an Electric

For the man who is the owner of an electric car the garage question is a somewhat different one. Ordinarily the small user of electric current cannot obtain nearly as low a rate for power for charging his storage batteries as is given the public charging station, and it is an open question as to whether the saving is sufficient to justify the expense for proper attention. If a good public charging station is located in the neighborhood it probably is the part of economy not to attempt a private garage. When it is desired to charge the car in a private garage the type of equipment will depend upon whether alternating current or direct current is supplied. If alternating current is to be used a special convertor for changing the alternating to direct current must be installed. The investment for tools and equipment other than the charging board is very low and need never exceed $20.

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Preparation Essential in Touring

THE comforts of a tour and the pleasure arising from it are generally obtained before the tour begins. It is questionable if there is anything in conjunction with motoring for its pleasure depends upon preliminary arrangements more than a country tour, be it for a day, 3 days, a week, 2 weeks or a month. The pleasure of a tour depends largely on the comforts obtained throughout it. That tourist who starts off not prepared will in nine cases out of ten come back disappointed with his experiences.

WHAT are the leading or cardinal preparations for a tour? The car naturally comes first. If it runs well from start to finish half the task is accomplished; but if on the other hand meeting constant troubles, such as a leaky radiator, out-of-adjustment carbureter, troublesome ignition, slipping clutch, and dragging brakes, the pleasures of a tour are practically decimated. First, then, the tourist should have his car in shape, by which is meant he should know that it is running well. If a car is not running satisfactorily around home, it cannot be expected to run satisfactorily when away from home, and a tour rarely brings much more severe usage than ordinary home travel. Before leaving on a tour the entire oil supply should be drained out and a new supply put in; the amount of lubricant in the different bearings should be looked after; and generally speaking a small metal box attached to the running board in which extra supplies of oil can be carried. It is always a safe plan to use your own grade of oil and not to depend upon buying whatever you can get at different points throughout the country. Running out of oil and having to buy some inferior grade at some cross road store may upset a tour. The oil may not be suited to the motor, it may carbonize too readily, foul the spark plugs, cause missing, cause overheating, and in general upset the entire motor system.

IT is always advisable before starting on a tour to provide the car with rubber bumpers, rebound straps, and in not a few cases shock absorbers. On a tour strange and unknown roads are encountered and it would be very unnatural if some holes were not struck at sufficient speed to bring the frame down on the axle and perhaps break a spring, or work some other injury. Rubber bumpers do not cost much, and it is easy to have them fitted. If you leave without them, and expect to put them on at points along the road, it is a certainty that you will not be able to get them when you want them. It is an old experience that rubber bumpers are the hardest to get while touring.

THE comfort of a tour to a great extent depends upon the facilities for protection against the weather. A top is generally desirable; when not in use it is folded back out of the way, adding little to the car weight, and when necessary it is truly a friend in need. The same is true with reference to a windshield, and side curtains for the top. Do not start out without some form of anti-skid chain, otherwise a sudden skid may land the car against the telephone pole, crushing a radiator, bending the frame, starting crank, or steering knuckle parts, and causing a delay of several days. "Stitch in time" is the only course to follow in this respect.

LASTLY, one of the great features in making a tour enjoyable is adequate and proper baggage facilities. Nothing is more destructive of good humor than to have the tire chains, oil cans, extra inner tubes, rain coats, wraps, pump, and a dozen other things piled in a mass on the tonneau floor to the inconvenience of the tonneau passengers and the destruction of the parts themselves. Everything in its place and a place for everything is the only law of touring. There should be baggage carrying facilities, which can be had by the score. The trunk rack, carried on the rear of the tonneau and providing space for trunks which will take suit cases, is an ideal arrangement. On arriving at the hotel it is only necessary to unlock the trunk and the suit cases can be removed without a minute's delay. Where trunks of this nature are not at hand it is an easy job to carry three or four suit cases in the tonneau, by standing them on end or lying them on their sides back of the front seat. Three suit cases can be carried lying on their side crosswise with the handle to the rear. A strap can be secured to the foot rail on the back of the front seat, passed through the handles of the suit cases and anchored to the foot rail. This strap will hold the suit cases in place on all kinds of roads and with the ordinary tonneau there is room for this. By having the suit cases bearing against one side of the tonneau there is ample room at the other side for entrance and exit.

IN packing the tools for a tour common sense should be used, and the tire tools and inner tubes should not be carried under the rear seat, otherwise, no matter how slight the tire trouble, it will necessitate the tonneau passengers getting out, piling the robes and cushions on top of the front seat, and generally disturbing everything. The best place to carry tire tools is on the right running board in a circular box inside of the tire casings.

BUT the carrying of the other tools is just as important as that of the tire tools, and reason should be employed in selecting just where the different tools shall be carried. If there is a tool box on the running board it should be provided with trays having receptacles for the different tools and each tool should be kept in its proper receptacle. If these are not furnished, the next best thing is a large tool roll with plenty of pockets and straps for the different wrenches, punches, screw drivers, and other tools. Such a tool roll should be carried in a box on the running board. It is of importance, however, that a pair of pliers and one or two small wrenches, such as the gas tank wrench and a small monkey wrench, be carried in the front seat pockets, so that it will not be necessary to unroll the tool roll in order to light the headlights, change an inner tube, or perhaps tighten the terminal on the motor. A driver's experience with his particular make of car will largely determine what tools he should have closest at hand, and there is no better place to carry these than in the pocket between the front seats. If there is no pocket of this nature, they can be carried under the front seat cushions.

THE carrying of rain coats, overcoats, and other extra clothing, not placed in the suit cases, is an important thing in a car. The best place is on the coat rail back of the front seat. This clothing should be put on first, that is, before the suit cases are brought up against them, as already outlined. With the clothing in this position it is in the cleanest part of the car, it occupies least space, it is out of the way of any possible injury, and is accessible. It is a grave fault to carry extra clothing loose on the seat or try to hold it in place by sitting on it.

Improvement of Roads Is Iowa's Aim

Legislature Considering Bill That Means Much to Motorists—Survey of thc Hawkeye Highway Has Been Completed

DES MOINES, Ia., March 6.—The entire state of Iowa is in the grasp of a most delightful malady and has gone absolutely good roads crazy. By the time spring opens up over 20,000 motorists, farmers, bankers, business men, hotel keepers, will be lending their efforts to make the state of Iowa the banner good roads state in the union. The good roads bill which has been in the legislature for some time has been revised and reported on favorably by the senate committee. This bill requires the turning back of part of the money received by the state for motor car licenses and numbers to the various counties from which the cars and numbers are registered. It applies to motor cycles as well.

The bill calls for 85 per cent of all the moneys received from motorists to be returned and this fund is to be used exclusively for grading and dragging the roads in the counties from which this money was received.

Booming Hawkeye Highway

Following close on this movement comes the announcement that the survey has been completed and that active work for improvement is to be begun on the Hawkeye highway, which is the road laid out last fall from Dubuque to Sioux City and said to be one of the most attractive of the many river-to-river routes laid out last year by good roads enthusiasts in Iowa.

This road dates its existence from the day the White Sign post road from Clinton to Omaha and the river-to-river routes from Davenport to Omaha were first talked of. The route just completed takes in the following cities: Dubuque, Manchester, Independence, Waterloo, Cedar Falls, Iowa Falls, Webster City, Fort Dodge, Cherokee, Le Mars and Sioux City, all of which are prominent motoring centers.

Paul Howe, of the Sioux City Tribune, and W. F. Parrott of the Waterloo Reporter, are the principal good roads boosters of this route, the officers of which are, Dr. F. A. Seaman, president of the Sioux City Automobile Club, president; C. A. Peaslee, of Dubuque, vice-president, and W. F. Parrott, of Waterloo, secretary and treasurer. Besides these officers there is an executive committee composed of members taken from every county through which the route passes.

Prizes For Good Roads

To stimulate interest and create rivalry between the counties a cash prize of $25 has been offered to the county making the best showing on the conditions of the road through its boundaries, and the Sioux City Automobile Club has offered a similar prize for the best method of marking the route through the cities by means of signs or any other device. In order to mark the road through the country districts Mr. Parrott has distributed 1,000 sheet metal signs enameled in blue with raised letters in white labeled "Hawkeye Highway," which are to be placed at regular intervals along the route and to be grouped at the turns so that the tourist can lay down his guide book and follow the blue and white signs over 285 miles of the road.

Activity is also being shown on the river-to-river route from Davenport to Omaha. Considerable improvement is to be made in this route just as soon as the season for road work opens up. With the interest displayed and promises of improvement this road will become more famous in 1911 than at any previous time.

Coupled with all the direct route work, the work of the individual counties is of great interest, and with the state work being pushed rapidly Iowa will soon have the best roads in the country, for the county roads will be more or less side routes from the main highways. As an example of the interest in the good roads movement, a meeting of the Rural Free Delivery Carriers at Clinton last week resolved itself into a good roads convention. So much interest was displayed that the Commercial Club of Clinton, headed by W. F. Coan, the Clinton banker and in reality the father of the good roads movements in the state, tendered a banquet to the delegates to the convention and, with the assistance of Professor T. H. MacDonald of the state university at Ames, swung the meeting into a big boost for good roads.

MARKER FOR HAWKEYE HIGHWAY

Mail Carriers Interested

Many of the mail carriers are motorists and use the roads every day in the year. In his speech on good roads Professor MacDonald related the work being done generally throughout the state. He showed by means of illustrated slides what can be done on the hilly roads and the results of draining the level roads so as to get rid of water in the rainy season. As the free delivery men are interested in good roads at all times, it was evident from the speeches made that the gospel of good roads can be spread in no better way, and it was voted to coöperate with free delivery men in other sections of the state in the effort to get the farmers, by personal visits, to take up the question generally.

OFFERS FREE ROAD TO STATE

Wilmington, Del., March 6—The offer of T. Coleman Du Pont, president of the E. I. Du Pont de Nemours Powder Co., to build a road the entire length of the state of Delaware, 103 miles, and present it to the state as a gift, has assumed definite shape, Mr. Du Pont having formally made his proposition in writing to Governor S. S. Pennewill. The latter, at Mr. Du Pont's request, has communicated with the legislature, sending it a copy of the offer and recommending that the necessary legislation be enacted at this session to make the proposition effectual.

Mr. Du Pont offers to buy, or acquire by condemnation, the right of way, to the width of from 100 to 200 feet, for a road from the northern boundary of the state to the southern boundary, with the understanding that he can make use of any roads now in existence where it is deemed advisable to do so in accomplishing his desired object—the shortest possible route. He proposes building an improved road, using such materials as are best suited, for a width of from 12 to 18 feet in the middle of the space acquired, the remainder of a 30-foot strip in the center to be used for trees and grass. On the remainder of the right of way he asks permission to build and operate a trolley line, telegraph and telephone lines, and to lay pipes for oil, gas, water, electricity, etc., in the event of a desire on his part to make such use of the land.

In return for the concession, upon completion of the portion of the road intended for a public highway, he proposes deeding it to the state, provided the state will agree to maintain it forever in the shape in which it is delivered.

GENERAL VIEW OF THE MAIN HALL IN WHICH BOSTON SHOW IS BEING HELD

Boston's Ninth Annual Motor Car Show

Opening of Gigantic Exhibition in Mechanics', Grand and Horticultural Halls a Most Auspicious One, 30,000 Turning Out First Night—Yankees Display Great Discrimination in Picking Out the Favorites, Being Particularly Interested in the Higher Grades of Machines—Decorations Somewhat Disappointing and Desired Forestlike Impression Is Lacking—Huge Oil Paintings Symbolize Universal Use of Motor Car Throughout the World—Palms, Greenery and Flower-Covered Lattices Pleasing to the Public Eye

BOSTON, Mass., March 6—Like a queen, Boston welcomed motordom as her guests on the occasion of the opening of the ninth annual show, the last of the major displays of the motor that will be held this season in the United States. The local show season commenced on Saturday night and found everything in complete readiness.

Mechanics' hall, where the chief features of the exhibition are shown, was ablaze with lights and color and crowded to its capacity from the moment when the gates were swung wide until the closing hour and it was estimated that the attendance amounted to at least 30,000 during the 3 hours of the initial session. It was a typical holiday crowd out for amusement, and like all other assemblies of its kind, it was not looking for business so much as it was seeking diversion. Nevertheless, there was a considerable amount of business accomplished, for the crowd contained quite a seasoning of buyers, despite its holiday appearance and character.

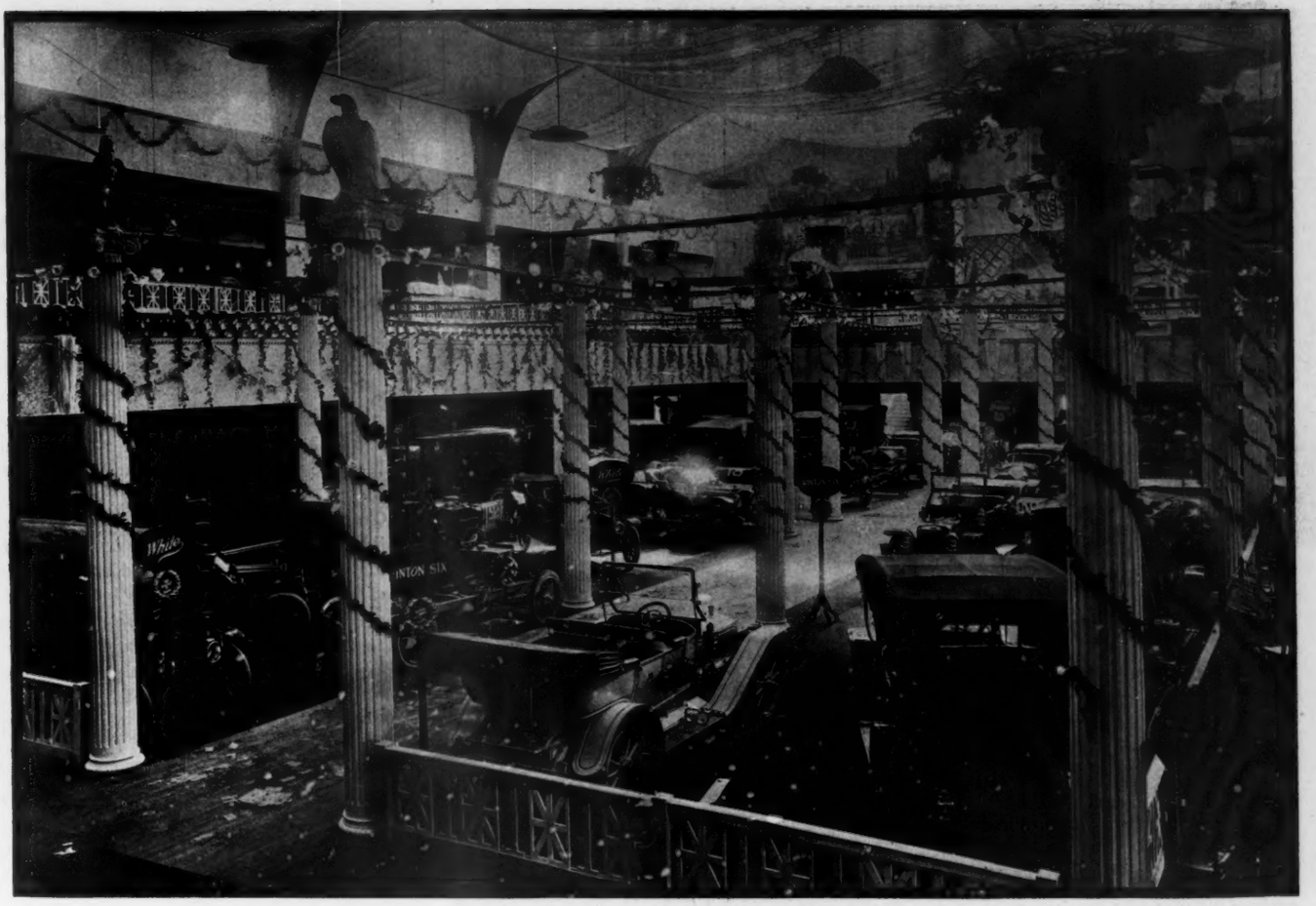
Business Prospects Good

Real business is due to commence tonight and on all sides the prediction is made that the present show will outstrip everything of its kind ever undertaken in New England. Interest is at the fever point. Every car-owner is prospecting around, either personally or by proxy, to learn of improvements and innovations, with the idea of eventually securing the successor of his present car and practically every man in New England who is in position to own a car, is actively thoughtful along that line. The day of experimenting, as it applies to the feasibility of the motor car, is in the past and the main question involved is one of desire, coupled with financial ability.

Public Interest Strong

Judged by the opening night, the show is destined to be a great success. The public interest is quite as strong as it is elsewhere in the United States; the crowds of sure-enough buyers are ready to patronize the motor car, and the cars, swarms of standard makes, representing the best in the line of American and foreign manufacture, are on display under ideal conditions.

The offerings at the Boston show are very complete. There are ninety-four different kinds of cars exhibited. In price they run the full gamut of motor car values, ranging from the most moderate



ONE OF THE AISLES AT BOSTON SHOW, GIVING AN IDEA OF THE DECORATIONS

Draws Thousands of New Englanders

Ninety-four Different Makes of Cars Are on View, Representing Every Grade, From the Little Cheap Runabout Up to the Stately $12,000 Limousine —Hub Display Slightly Larger Than the Recent One in Madison Square Garden, New York, but Not Up to Chicago in Point of Number of Exhibitors—Commercial Vehicle Display in Basement of the Exhibition and Grand Halls Is a Most Comprehensive One—Show, Conducted by Boston Automobile Dealers' Association, Is Ready to Open at Hour Originally Scheduled

priced of the small runabouts to palatial limousines and special show cars that are listed as high as $12,000. There are scores of absentees in Mechanics' hall and the overflow show in Horticultural hall that were present at New York and Chicago. There are several companies represented here that had no representation in either of the other big shows.

New England Buyers Discriminating

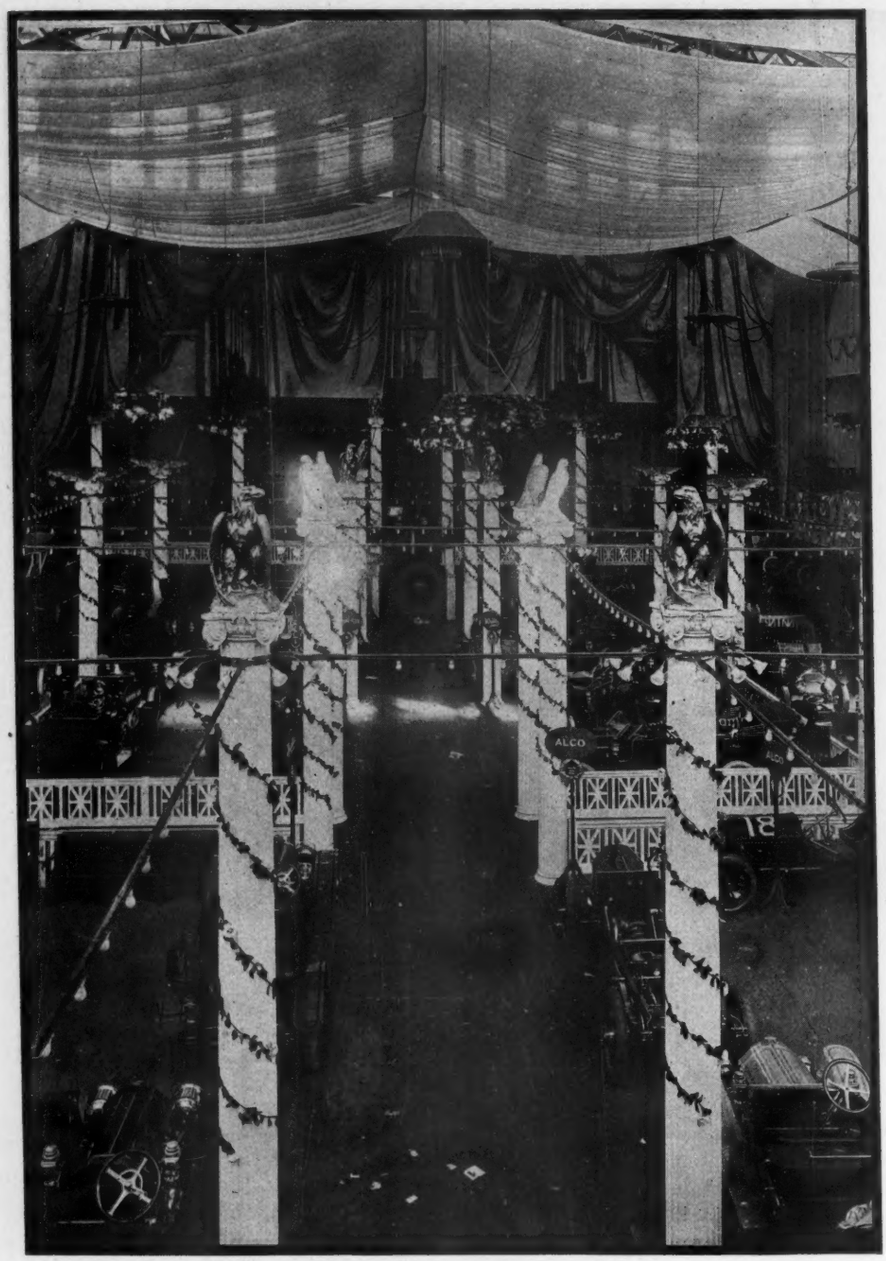
The general characteristic that is most palpably apparent is the high quality of the motor cars displayed. New England demands quality whether it be in man, material or manufactured product, and this principle is carried out to finality with regard to the motor car. Junk is as thoroughly out of place in Boston as furs are in Havana. It would not pay for time and trouble necessary to display junk in Yankeedom and for that reason none is displayed—at least a second time.

The Yankee buyer has a sense of fine discrimination. He has a constitutional aversion to paying dollars for anything worth only 99 per cent and has a horror of buying something that proves to be worth less than that figure. This tendency is by no means confined to his relations with the motor car, for it includes every other line of human endeavor as well. Knowing all these things, the management of the Boston show is a unit in declaring that 1911 will set a new mark in the matter of business, as it assuredly will in attendance and general artistic charm.

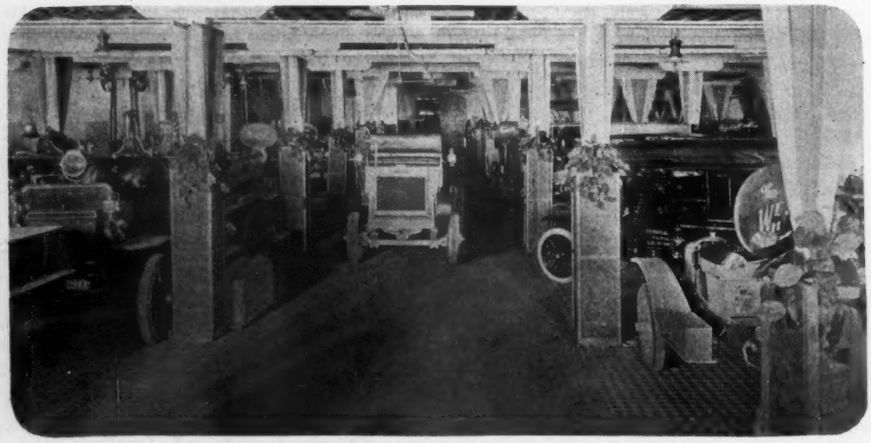
The local press states unanimously that the present show is the largest and most beautiful and most important ever held. This is not strictly true. There are a few more cars shown than were on display at Madison Square garden, but there are fewer than the number that appeared at Chicago. The decorations are not as dignified as those at the great New York show and not as ornate as those at Chicago, but they are adequate and artistic and surely accomplish their entire mission.

Appearance of the Show

Entering the loggia to Exhibition hall the forestlike impression that was promised is somewhat disappointing. There is not enough of it to make the corridor look like woodland and too much to allow the impression of the ballroom. Exhibition hall proper is a rather small show space. The well that is surrounded by the balcony is assuredly not more than 100 feet square. There is a wealth of



TALL WHITE COLUMNS MAKE SHOW LOOK IMPRESSIVE, WHILE THE OTHER ORNAMENTS ADD MUCH TO BEAUTY OF THE SHOW



COMMERCIAL CARS ARE ON VIEW IN BASEMENT

palms, greenery and flower-covered lattice used in the decoration of Exhibition hall, but the feature of the artistic side of the work is a series of huge oil paintings that are ranged along three sides of the enclosure. These pictures are mostly on the impressionistic order and have to be viewed from a distance in order to be appreciated. They represent landscapes in all parts of the world and are said to have been copied from actual photographs of typical road scenes in various lands. The idea they are intended to symbolize is the universal use of the motor car throughout the world. It would require a rather vivid imagination to reach that conclusion as the result of a single cursory inspection, but if the intent is taken at its face value, the pictures might serve their purpose.

Opening out of Exhibition hall is Grand hall, a huge show place. The whole character of the decoration is changed in this section of the show. The big room is paneled in red and gold and its corinthian columns, surmounted by golden eagles, give the idea of sumptuousness that is not conveyed by those in the other room.

The Grand Hall

There is a vast stage at one end of Grand hall and it is occupied by the exhibit of Packard and Cadillac cars. Other Michigan products such as the Brush, Sampson and a few electrics; Indiana cars such as the Premier and Amplex; Ohioans like the White, Winton and Peerless, and New York, represented by the Pierce-Arrow line, form an important part of the exhibits in Grand hall, but the bulk of the cars displayed are those of Yankeedom. The Alco, Stevens-Duryea, Pope-Hartford and the Atlas have prominent spaces and in various places other makes are being shown.

The overflow show at Horticultural hall is small. There are displayed the new Lenox, Cutting and a few others. The decorations of this section of the show are simple. Horticultural hall is located about half a mile from the main building.

In Exhibition hall are shown the foreigners, including the Fiat, Renault, S. P. A., etc.; the New Englanders, Locomobile, Corbin, Grout, Columbia, and such cars representing the middle west as the Stearns, Chalmers, Moline, Ford, Marmon and Velie, and those of the east such as Matheson, Maxwell and Thomas.

Truck Show in Basement

In the basement under Exhibition and Grand halls is the truck show and a few passenger models of various kinds. The truck display is by far the largest ever shown in New England and contains samples of practically everything that has been successful in the test of practice that has been displayed elsewhere this season. As a majority of the big manufacturing companies of this section which have been successful in making passenger cars also produce a truck model or two, New England is well represented in this division

of the show. Aside from the commercials, the Morse, a substantial pleasure car, makes its debut in the basement.

In the balconies surrounding both Exhibition and Grand halls and in various adjoining rooms are shown a full line of accessories of all sorts and descriptions.

The music is furnished by two orchestras composed of women musicians, and the programs include numerous masterpieces of various periods. Popular airs of the vintage of 1901 were quite plentiful on Saturday night, but were well executed and enjoyable.

The Show Management

The show is being conducted under the auspices of the Boston Automobile Dealers' Association under the direction of Secretary Chester I. Campbell, as general manager. It was ready for the public precisely on the advertised minute and in all its details is a model of excellent administrative ideas and practice.

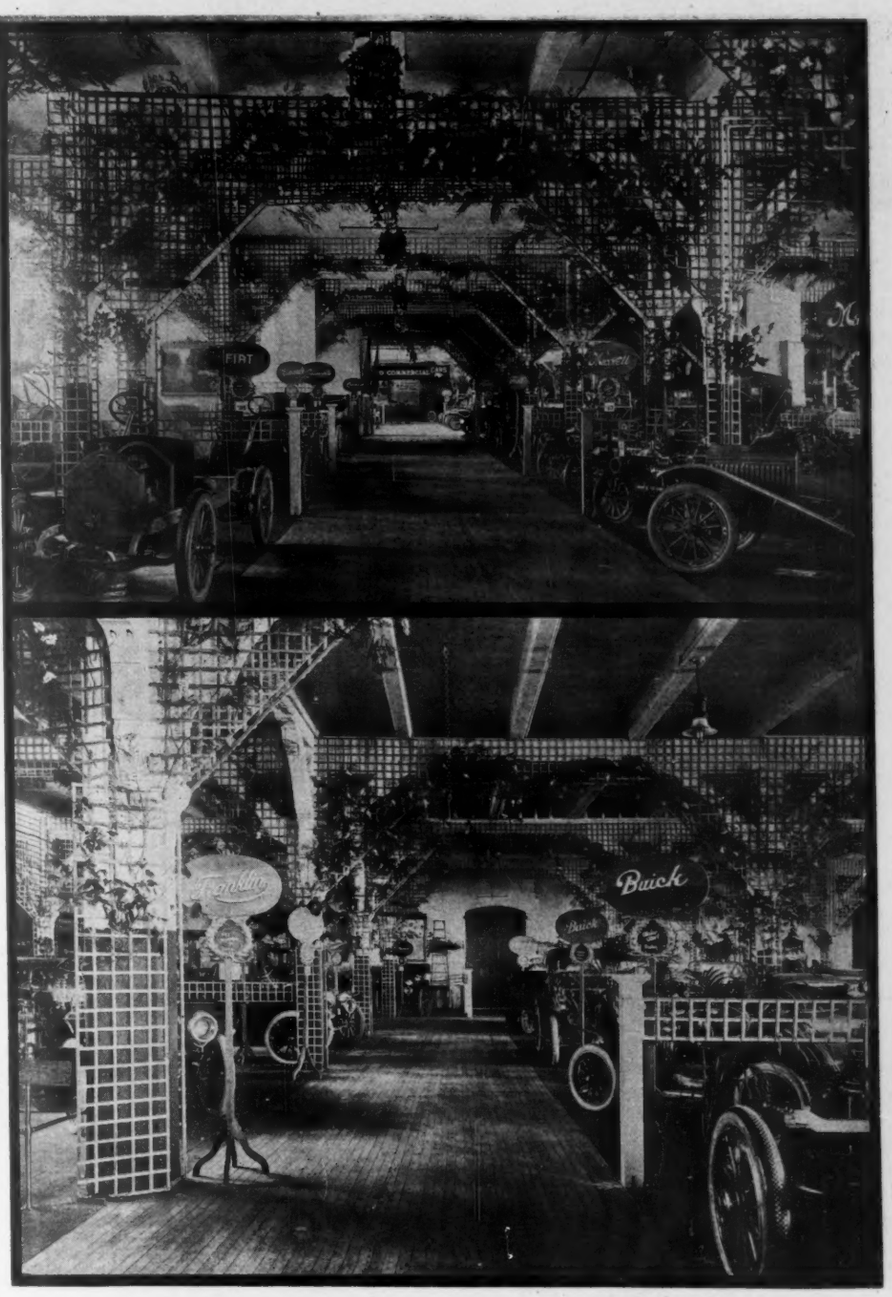
Tonight will be officially known as business night; tomorrow will be military night; Wednesday will be society night, and every session will have its special features right up to the close.

At Least 1,500 Dealers

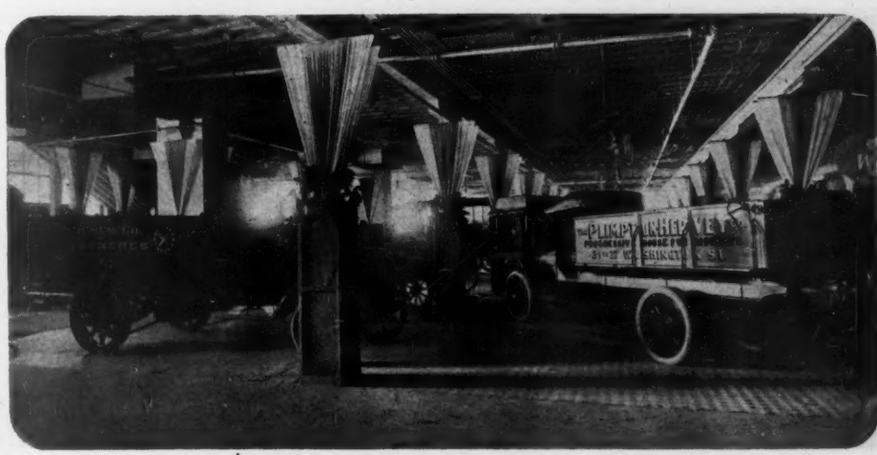
When one compares the number of dealers from out of town at the Boston show this year with those of other years it makes interesting figures. Last year it was thought that about the maximum had been reached, when the number was in the vicinity of 600. This year it is nearer 1,500. Some of the Boston men have from twenty to twenty-five subagents at the show, and there are any number who have about a dozen. When one figures out that there are more than 100 dealers in pleasure cars alone, and nearly half as many commercial dealers, it is easy to realize the great out-of-town aggregation.

Naturally, with so many from all sections of New England and parts of Canada, there are sales being made every day —morning, noon and night—faster than one can keep track of them. And this means retail sales, for the show is more of a retail show than a wholesale one, although a wholesale business is done that totals up pretty well. When the week ends it is probable that there will be something like 500 orders booked for cars which will be filled. A number of tentative orders will be taken which are apt to fall through, but not to any great extent.

The trucks, too, are going well. From many of the smaller cities in New England, dealers have brought men who are interested in the new modern methods of transportation, so that they could see all sorts of commercial vehicles. These men have been wandering about the show getting a line on the difference between gasoline and electric, and making up their minds what to purchase. It is expected that the sales of trucks this year will be so far ahead of a year ago that there will be no comparison.



FLOWER-TRELLIS EFFECTS WHICH ARE NOTED AT THE BOSTON SHOW SIDE AISLES THAT LOOK ATTRACTIVE TO THE NEW ENGLANDERS



IN THE BASEMENT IS DISPLAY OF MOTOR TRUCKS

STAGE ON WHICH CARS ARE SHOWN AND ONE OF AISLES

Strong Point of the Big Boston Show

Only Three Makes of Cars on View That Have Not Been Exhibited Previously This Winter, the Lenox and Morse in Passenger Division and the Harrison Commercial Truck

WHEREAS there are but three new cars on exhibition at the Boston show that have not been shown at any of the other shows of the season, there is much that is interesting in the sundries line.

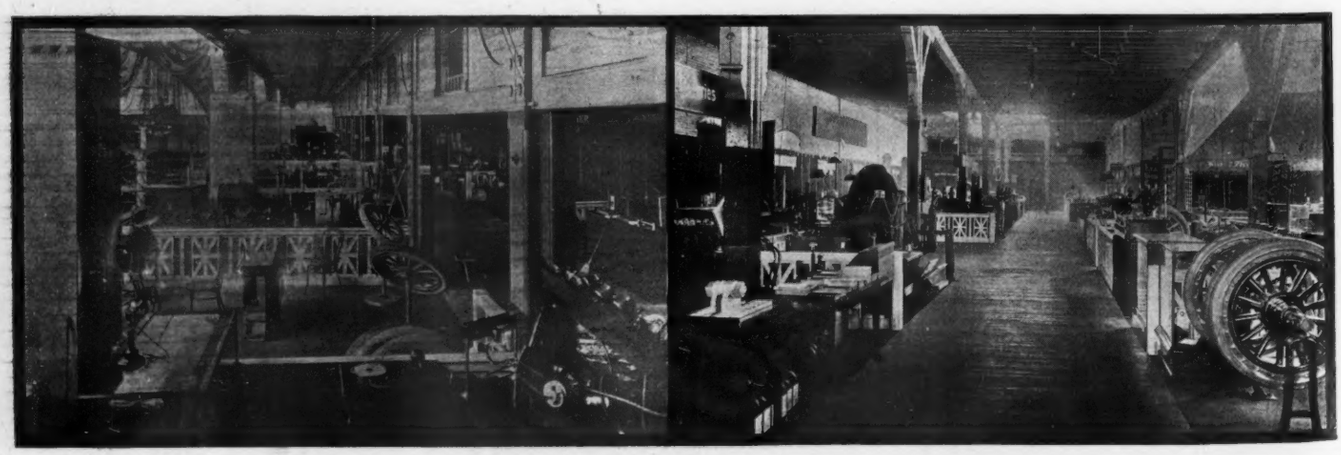
The three new cars are the Lenox, a pleasure vehicle with a four-cylinder, L-type, water-cooled motor, a leather-faced cone clutch, a propellor shaft inclosed in a torsion tube, a three-speed selective gearset in unit with the rear axle, 34 by 4-inch wheels and a 114-inch wheelbase; the Harrison 3½, 5 and 12-ton trucks with four and six-cylinder L-type, water-cooled motors, leather-faced cone clutch, three-speed selective gearset, side chain drive, 36-inch wheels equipped with solid rubber tires and wheelbases of 116, 132 and 155 inches respectively; and the Morse, a high-grade pleasure car having a four-cylinder vertical water-cooled motor, multiple-disk clutch, four-speed selective gearset propellor shaft in a torsion tube, 36-inch wheels and 112-inch wheelbase.

The cylinders of the Lenox motor are cast in pairs, have a bore and stroke of 4⅛ and 5¼ inches respectively, and the valves are all on one side and operated from a single camshaft contained within the crankcase. The crankcase is of aluminum, is divided horizontally, and the lower half is subdivided horizontally for the greater part of its length to form a partition between the splash compartments of the crankchamber and the oil reservoir of the circulation oiling system employed.

Lenox Oiling System

In this oiling system the lubricant is drawn from the oil reservoir by means of a gear pump, gear-driven off the camshaft, which feeds it to the engine gears and to the splash compartments of the crankcase, from which it is scooped by the connecting-rods, and formed into a mist for the lubrication of the cylinders, pistons and all internal crankcase mechanism, and in which a constant level is maintained by means of overflow pipes. Transverse vertical partitions also are provided in the crankcase to prevent unequal distribution of the oil in the splash chambers when ascending or descending steep grades. Ignition is by means of a high-tension dual system, with a magneto and dry-cells storage battery. Cooling is effected through the use of a cellular radiator, a gear-driven centrifugal pump, and unusually large water pipes of drawn copper tubing fitted with ground joints.

The clutch has springs under the leather to insure easy engagement, and is of simple and accessible design. A pressed channel steel frame is used, which is raised over the rear axle to give ample spring clearance. Long flat semi-elliptic front



TWO VIEWS IN SECTION WHERE ACCESSORIES ARE BEING DISPLAYED

AS THE BOSTON SHOW LOOKS FROM ONE OF THE GALLERIES

Is the Display of Motor Accessories

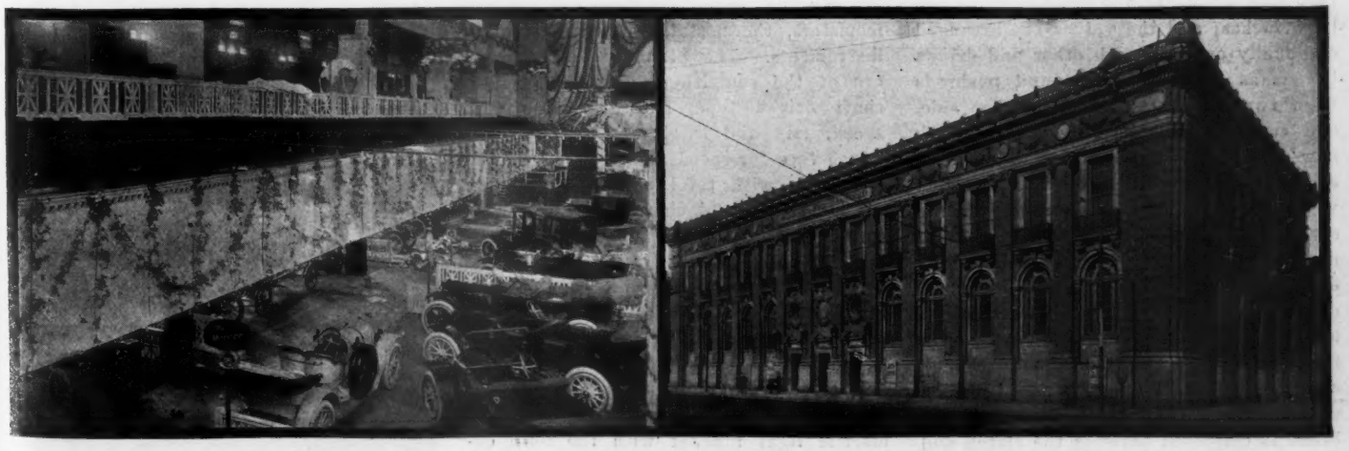
In the Way of Sundries There Is a Great Variety of New Things To Be Seen in the Way of Speedometers, Pumps, Storage Tanks, Windshields, Magnetos, and Ignition Devices

and three-quarter elliptic rear springs are employed. The steering gear is a worm-and-sector type with ball thrust bearings, and the cross connecting link behind the front axle. The front axle is an I-beam drop-forging with ball bearings for the wheels. The body is a five-passenger fore-door type, of an artistic straight-line design trimmed with Circassian walnut to match the dash.

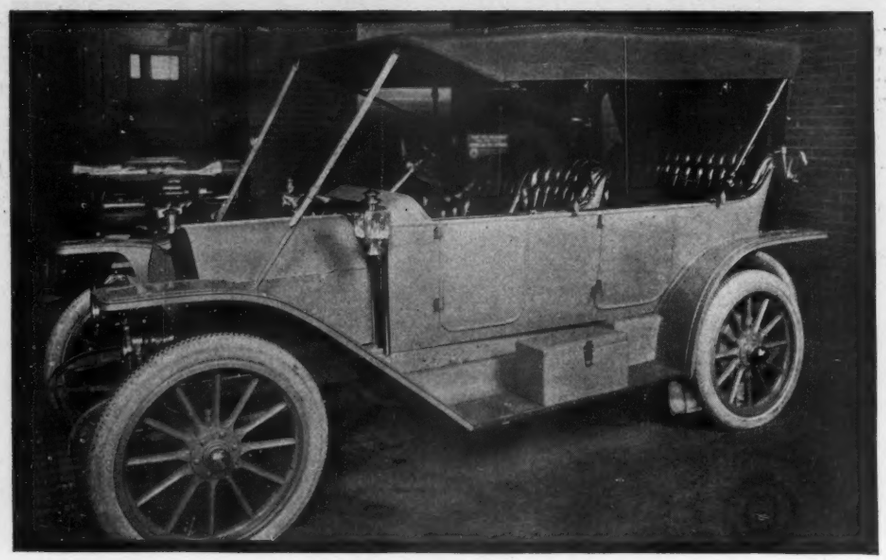
The Harrison Trucks

The Harrison motor trucks have a number of unique features not to be found in other trucks on the market, and many of the best features employed in up-to-date engineering practice as well; these special features include: Three-point suspension of the motor and gearset; two radiators of very substantial construction, one mounted at the front end of the vehicle in a conventional manner and the other arranged horizontally between the side frame members at the rear of the chassis; two independent systems of ignition are employed, one comprising a Bosch high-tension magneto and one set of plugs, and the other a storage battery, timer and coil; a circulating oiling system is employed in the motor; auxiliary coil springs are used in conjunction with long semi-elliptic side springs, so that liberal spring action is obtained both with and without load; the clutch is operated by means of a lever instead of a pedal; a clutch brake and interlocking device is provided to facilitate gear changing and prevent damage to the gears; a torsion rod communicating between the front and rear axle is fitted to prevent damage to spring construction when road obstructions are encountered at speed; and the wheelbase is comparatively short to allow the truck to be easily handled in narrow or crowded streets.

The design in both the four and six-cylinder models is practically the same. The motor cylinders are cast in pairs, with the valves in the head and operated by means of rocker arms and pushrods from a single camshaft. The bore and stroke are 4⅝ by 5 inches. A gear-driven pump, belt-driven fan are features of the cooling system. Power is transmitted from the motor through an inverted leather-faced cone clutch and shaft to the gearset, which is of the sliding selective type, giving three forward speeds. The differential and bevel-gear jackshaft drive are incorporated in the gearset case, and side chains transmit power from the jackshaft sprockets to the rear wheels. Timken ball bearings are employed throughout the car, and the construction contains many more interesting details that lack of space will not permit bearing upon at this writing.

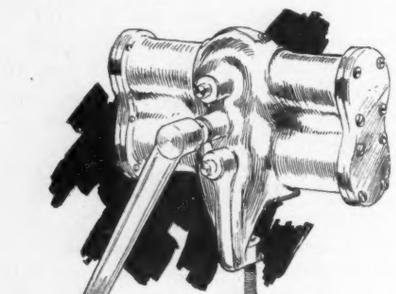


LOOKING FROM BALCONY—HORTICULTURAL HALL, ONE OF SHOW BUILDINGS



LENOX FOUR-CYLINDER CAR SHOWN IN BOSTON

The Morse car is not exactly a new product, but it makes its intial appearance this year at the Boston show. The motor is a four-cylinder, four-cycle, valve-in-the-head type, with its cylinders cast separately and mounted upon an aluminum crankcase which is webbed to the side members of the frame and is divided horizontally so the lower portion containing the splash compartments and reservoir of



HAWTHORNE TIRE PUMP

the circulation oiling system may be readily removed without disturbing the five main bearings of the crankshaft. The bore and stroke of the cylinders are 4⅝ by 5 inches; and the valves are arranged diagonally opposite each other and driven by means of rocker arms and pushrods from two camshafts, one on either side, and contained within the crankcase. A new Eisemann high-tension dual magneto system is employed in the ignition system with drycells to facilitate starting on the spark and otherwise. The features of the cooling system are, an adjustable belt-driven cast aluminum fan, a cellular radiator, a gear-driven centrifugal pump, and direct piping connections. Power from this motor is transmitted through a multiple-disk clutch of special design and running in oil; and a cone clutch brake is employed between the clutch and gearset to facilitate gearchanging and protect gearteeth. The gearset is a selective sliding gear type giving four forward speeds and having its shafts mounted in the same horizontal plane. The propellor shaft is contained in a torsion tube which has a large ball-and-socket bearing at its forward end that encloses the universal joint and forms for it a grease-tight case. The rear axle is a semi-floating design; an I-beam front axle is employed; the steering gear is of the worm-and-sector type with the cross link behind the front axle. Hess-Bright ball bearings are used throughout the gearset and running gear. The frame is a pressed steel construction of channel section, raised over the rear axle, and it is mounted on long semi-elliptic front springs, and scroll elliptics in the rear. Brakes are of the internal expanding type acting on separate concentric drums of the rear wheels, and the control of the car is conventional in practically all other respects.

Standard Speedometers

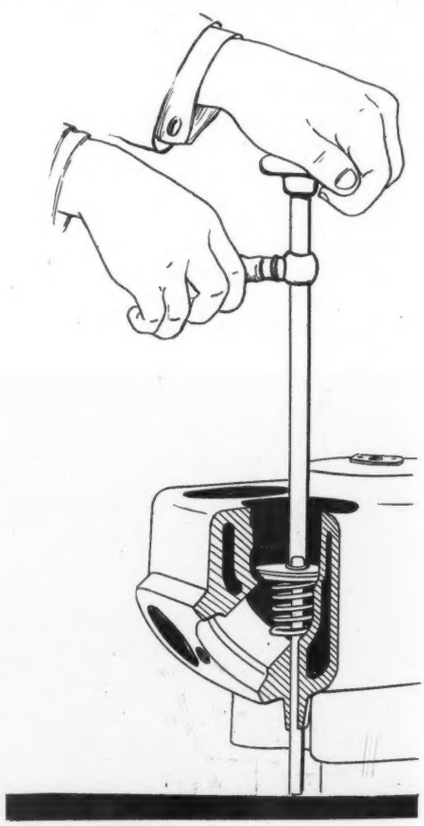
In offering the 1911 line of Standard speedometers the Standard Thermometer Co., Boston and Amesbury, Mass., enters into its fourth season of speedometer manufacture. For more than a quarter of a century this concern has been making thermometers, thermostats and various other instruments. The Standard speedometers are of the centrifugal governor, flexible shaft driven type, and are made with speed, trip and total mileage dials and 3-inch face for speeds up to 40, 50, 60 and 80 miles; with total mileage and speed dials only with 3-inch face and speeds up to 60 miles; with trip, speed and total mileage dials with a 4-inch face and for speeds up to 60 and 80 miles; and in combination clock and speedometer sets comprising a Boston or Chelsea clock, and a 3-inch 60-mile speedometer with speed, trip and total mileage dials; or a 4-inch 60-mile clock set. Both clock sets have an electric light bracket with the bulb enclosed in a brass protector. There is an important change in the 1911 type of speedometer over those made heretofore, in that, instead of the pivoted design of governor, a new and original sliding weight governor is employed.

Reliance Speedometer

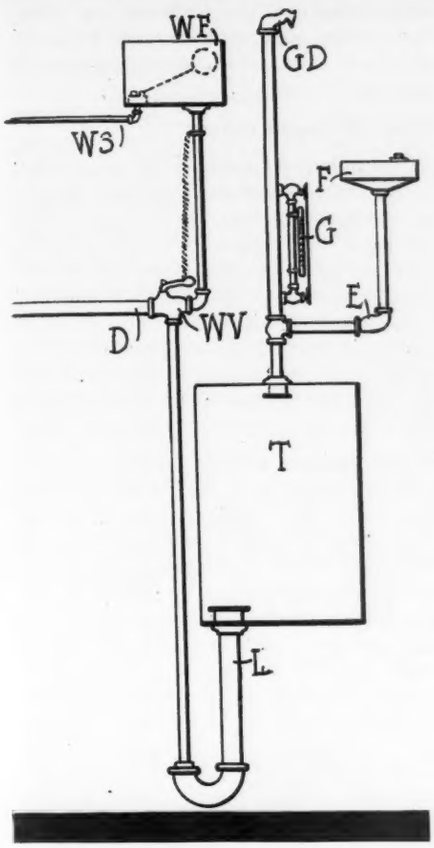
Early in 1909 the Reliance Speedometer Co. was organized. These results are claimed to have been brought about and for 1911 the Reliance instruments are being furnished in two models: Model A has a 3½-inch face, and shows from 3 to 60 miles an hour, and model B has a 4-inch face and registers from 4 to 90 miles an hour. Both have a 100-mile daily trip odometer, showing fractions of a mile, consisting of a short red hand registering with a dial marked in red, which has a quick setting device whereby one turn in either direction sets it back to zero. A feature of the 1911 Reliance line is the combination speedometer and clock and electric light, on which either of the instruments may be used. The clock is set above the speedometer and is a stem wind and set.

Cleveland Speed Indicators

The line of speed and time indicators manufactured by the Cleveland Speed Indicator Co. comprises four speed and time indicator models for pleasure and commercial vehicles and three different combination clock, indicator and electric light sets. The Cleveland instruments differ from the ordinary type of speedometer in that they not only indicate the speed at which a car is traveling, but they also record the actual running time for the day, the mileage for the day, the



FLEXIBLE VALVE GRINDER



HYDRAULIC GASOLINE SYSTEM. T, STORAGE TANK; WF WATER FLOAT; WS, WATER SUPPLY; F, GASOLINE FILLER; G, GAUGE; WV, WATER CONTROLLING VALVE; D, TO DRAIN; E, ELBOW CHECK VALVE IN THE SYSTEM

average speed for the day, the actual running time for the season, the mileage for the season and the average speed for the season; and the indicators recording the trip hours and trip mileage may be reset to 0 as desired. The flexible shaft automatically winds the clockwork of the indicator and revolves one-quarter as fast as the front wheel from which it is driven. A new indicator for motor trucks manufactured by this concern has been designed especially to meet the demand for information. Its constructive principle does not differ materially from the instruments designed for pleasure cars; but it is more simple, because the speed mechanism has been removed as not being essential to the requirements of the service for which it is intended.

Hopkins Volt-Speed-Ammeter

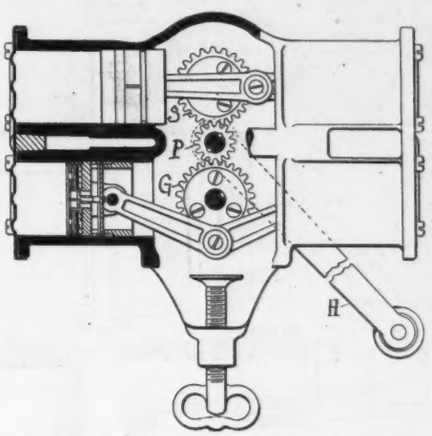
The Hopkins volt-speed-ammeter is a combination of the Hopkins electric speedometer and the volt-ammeter in common use on all electric pleasure vehicles, the volt-meter element of the volt-ammeter being used to indicate both the volts and speed. When the two-way switch below the indicators is thrown to the left or volts side, the meter reads the electric pressure of the battery exactly the same as though the volt-ammeter were connected permanently to the circuit. When the switch is thrown to the right or speed side, the same indicator reads the electric pressure, volts, of a small magneto generator which is gear driven by the left front wheel of the car, but in terms of speed in miles per hour, because when a system of coils is rotated within a permanent magnetic field an electric voltage is generated in direct proportion to the speed of rotation of the moving coils. Therefore the condition of the battery in volts or the speed of the car in miles per hour may be read at will.

Stover-Lang Meter

The Stover-Lang speed mileage meter, made by the Stover-Lang company, of Boston, differs from all other types of speedometers in several respects. Its characteristic feature is its means of operation. It does not employ a flexible shaft driven by gears from a road wheel, but is operated by puffs of air forced through a rubber tube which communicates between a diaphragm device upon the steering arm of the wheel spindle in the regular way and the recording instrument secured to the dash. The diaphragm device is operated by a large double-faced cam-ring which is secured to the vehicle wheel in the same fashion as the large gear of the ordinary speedometer. The recording part of the instrument is made of heavy brass contained in a case with round corners and edges, which screws flat to the dash; and it is comprised of speed indicator reading from 0 to 70 miles an hour, a daily trip and total mileage meter, a clock and an electric light. The trip mileage may be readily set at any mileage as well as at zero. The winding and setting of the hand and regulating are all done from the outside of the case, which is almost hidden in a recess at the upper left corner. And the electric lamp is lighted when the lamp is pulled out of the case and extinguished when it is pushed back into it again.

Hawthorne Hand Pump

The Hawthorne four-cylinder hand pump differs from the majority of hand pumps in that it is operated by turning a crank instead of a reciprocating motion. It has four cylinders arranged in pairs on opposite sides of a central gearing. These cylinders are 1¾-inch bore and 2-inch stroke, the net output of the pump being the same as a single cylinder with 8-inch stroke. The operating crank H attaches to a small pinion P, which meshes with two gears G, to which the plungers of the pumps attach. The gearing is 2 to 1. Air is admitted to the cylinders in the center of



INTERIOR HAWTHORNE TIRE PUMP

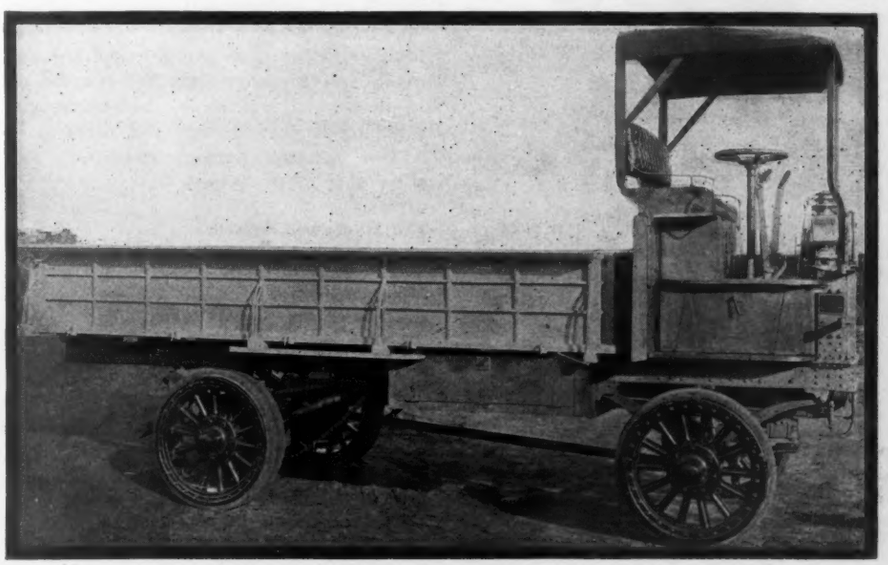
the piston head. The inlet valve in the head of each piston is mechanically actuated with a piston ring. Each piston is fitted with a close-grained leather washer forming a compression ring.

Flexible Valve Grinder

The valve grinder of the Flexible Valve Remover Co., Providence, R. I., is a screwdriver type. It is 12 inches high and is operated by a handle at the side, which is moved up and down in a groove, this movement rotating the screwdriver first in one direction and then in the opposite one. The knob at the top is on a swivel, which gives a stationary support for the left hand.

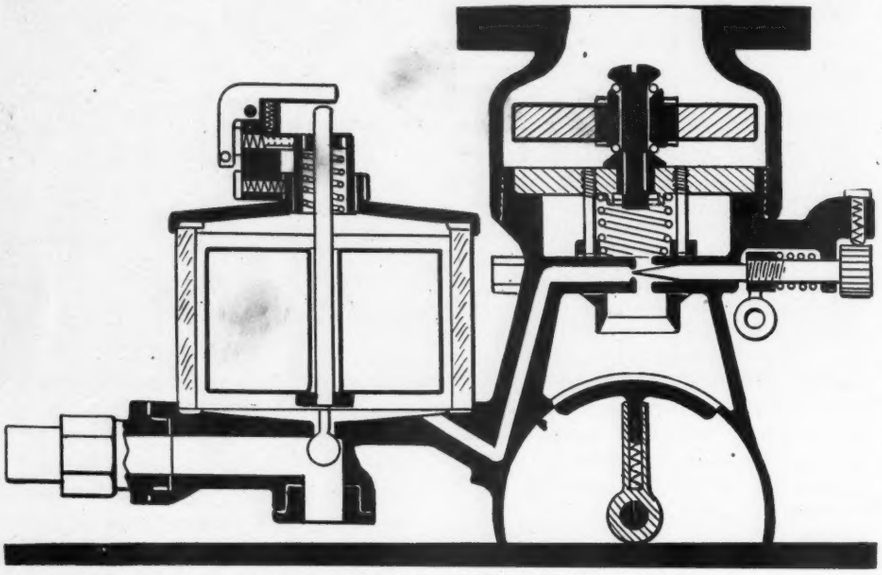
Warner Auto Meters

The Warner Instrument Co. of Beloit, Wis., shows a comprehensive line of speed indicators and combination clock and



THE HARRISON TRUCK SHOWN AT BOSTON

speedometer sets with electric lights. There are four models of the barrel type with and without the Chelsea clock, which, when fitted, is arranged above the speedometer and has a 3⅛-inch dial. These instruments are equipped with Veeder odometers and show speeds up to 60 and 100 miles per hour, trip mileage to 100 miles and repeat, and season mileage to 10,000 miles and repeat. There also are two models of the clock type, each of which is also made up into a combination set, and these have a 4½-inch face, a large figure Warner odometer registering up 100,000 miles and repeat for season mileage, and 1,000 miles for trip mileage and repeat, with means for resetting trip odometer to zero with one turn. The entire face of these instruments is lighted from the inside. In addition there are two models, known as the twins, with the clock and meter arranged side by side. The meter in these sets is of the same design as the one just described, and the instruments may be finished in brass, nickel, gunmetal or dead black.



HOMO CARBURETER INCORPORATING THE HOMO MIXER

NEMO ELECTRIC TAIL LAMP

Bowser Storage Tanks

S. F. Bowser & Co. show a number of self-measuring storage tanks for gasoline and lubricating oils. With these tanks, when a motorist wants gasoline or oil, he has but to set a small lever to the point marked gallon, or half gallon or quart, then turn the handle, and the pump will at a stroke automatically measure the amount of oil desired. Other valuable features of these outfits are: a locking device which prevents operation of the pump without the proper key; a discharge register which tallies the gallons as they are pumped, from 1 to 10, and then repeats. The gallon meter can be furnished if desired, which records all the gasoline passing through the pump up to 5,000 gallons.

American Storage Tanks

A number of different types of self-measuring oil pumps and tank outfits are shown by the American Oil Pump and Tank Co., Dayton, O. American oil pumps are all single-cylinder, double-acting types which discharge a continuous stream of liquid, and measure any quantity desired up to 1 gallon at a stroke. They indicate each gallon as it is pumped, and the cylinders, valves, valve-seats and faucets are of brass. All valves are accessible, and can be removed, cleaned and replaced in a few minutes without disturbing any other part of the pump.

The Hydraulic System

The Hydraulic Oil Storage Co., Detroit, Mich., exhibits a unique gasoline and oil storage system which is operated by the regular city water pressure, and which depends upon the difference in specific gravity of water and oil, for the advantages claimed for it. Among these advantages claimed for the Hydraulic system of gasoline storage are: That fuel cannot be exploded by fire, lightning or electricity; there is no air in the storage tank at any time, it being always full of liquid gasoline or water or both; there is no loss from evaporation; no gas is forced out when the storage tank is filled; the gauge is always in view, which shows quantity of gasoline in tank.

Gilbert & Barker Outfits

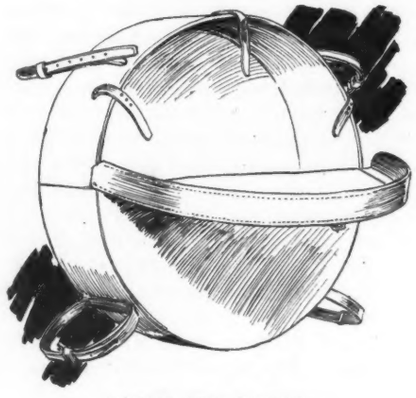
The Gilbert & Barker Mfg. Co., Springfield, Mass., has several of its designs of self-measuring pumps and tanks for kerosene, gasoline, naphtha and other liquids, on exhibtion. The line includes square or cylindrical storage tank with or without measuring outfits and adapted for inside, outside or underground arrangements; and an all-metal syphon and a transfer pump, for emptying barrels, drums, oil containers, etc.

Wayne Gasoline Storage Outfits

Several features of the Wayne Oil Tank and Pump Co.'s line are shown, among which is the model G outfit, designed to meet the demand for a high-grade storage system at a moderate cost, where the self-measuring feature is not essential. This outfit affords a safe as well as convenient means for the storage of gasoline. The construction is such that the liquid drains completely back to the underground tank when pump is not in use. The model G outfit is made in two types, long distance and direct lift, and in two sizes, 1 and 2 barrel capacity. The tanks are made of heavy galvanized iron, with flanges of pressed steel.

Haines Self-Measuring Outfits

A number of self-measuring gasoline and oil pumps, tanks and complete oil handling outfits are shown by the Haines Measuring Pump Sales Co., Harrisburg, Penn. The Haines patent, long-distance, self-measuring pump for gasoline is designed especially for handling gasoline in public or private garages and it has many advantages. It is especially heavy throughout in order to stand hard usage; it measures 1 gallon per stroke of plunger, requiring two turns of the crank per stroke, and delivers oil rapidly and easily. Each pump has a two-way discharge with Y connection, one side of Y for delivery into can and the other side has a lever shut-off cock for hose connection. A lock and combination register is provided for each pump, and there



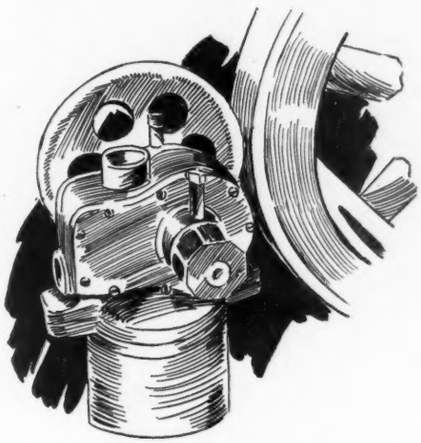
SAGE'S TIRE TRUNK

are dials for tallying each gallon and fraction thereof up to 10 gallons.

Electrical Sundries

The Burn-Boston Battery and Mfg. Works exhibits a dry cell which is not exactly a dry battery, but as far as practical usage is concerned it is a combination of a dry and wet cell with a reservoir of liquid. It will not freeze and is put up in square paper cases.

For use in connection with its three sizes of Columbia dry cells for ignition, the National Carbon Co., of Cleveland, O., shows its new Columbia multiple battery, which consists of sets of dry cells enclosed in a simple waterproof case which has two main terminals on top and looks like a



BILGE POWER PUMP

storage battery. It is made in three standard sizes for accommodation to any local conditions, any class of service and any ignition system.

Cello Hermetic Battery Cases

The A. S. Campbell Co., Boston, is showing a new line of Cello hermetic battery cases, for six dry cells, which when closed form a compact waterproof unit having the appearance of storage batteries with two main terminals on one side of each case. These cases are made in ten sizes.

A. S. Morss Co., Boston, manufactures the Weelite electric hand lamp, which is designed for use in connection with the lighting or ignition battery or magneto, for the purpose of facilitating the search of trouble and other operations upon the motor or car.

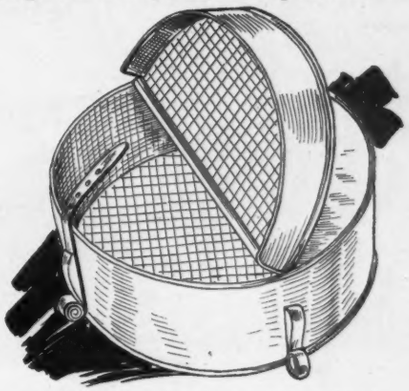
Two new spark plugs, the Vizzo and Star Spark, are on exhibition. The Vizzo, made by the Phillips-Potvin Mfg. Co., Minneapolis, is a novelty in that it has a spark gap in the upper portion of its central electrode which is visible through the glass cylinder in which it is inclosed. The advantages claimed for it are that the gap intensifies the spark at the firing points, and, being visible, aids in locating trouble. The Star Spark plug is made by the Hampshire Mfg. Co., Hatfield, Mass., with either mica or porcelain cores, and being of the inclosed end type is claimed to be self-adjusting, self-cleaning and not affected by oil.

Holtzer-Cabot Lighting System

The Holtzer-Cabot Electric Co., Brookline, Mass., in addition to its other charging, igniting, signaling, carbureting and tire-inflating devices, has brought out a new electric lighting system comprising essentially a simple Holtzer-Cabot variable-speed dynamo and a new Edison storage battery. A permanently adjusted governor automatically regulates connection between the generator or dynamo and battery at a speed approximately 1,800 revolutions per minute, and it is recommended that the dynamo be driven by gears or by means of a special friction drive.

Morse Electrical Appliances

A very complete line of electrical appliances—such as lamps, brass and fiber sockets, primary and secondary terminals, hard rubber connectors and switches—is manufactured and shown by Frank W. Morse, Boston. One particularly handy device for public and private garages and repair shops is the portable garage floor lamp, which consists of a telescoping stand which can be adjusted up to a height of 6 feet, a three-lamp cluster on a



AJAX WOOD BODY TIRE TRUNK

tilting swinging joint and a guard over the lamps, a 15-inch reflector, 20 feet of slicked extension cord, and a two-piece plug. The weight of the outfit is 25 pounds.

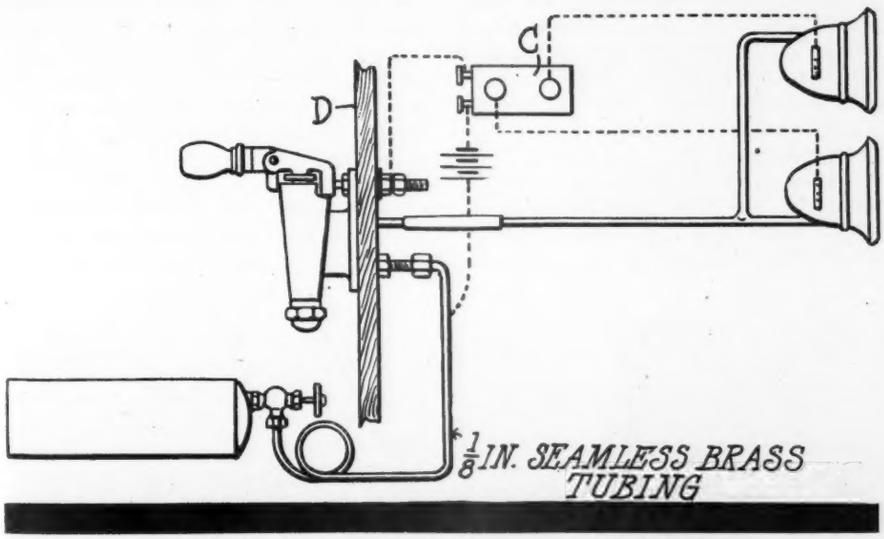
Culver-Stearns Electrical Appliances

The Culver-Stearns Mfg. Co., Worcester, Mass., has a number of its features of electric lighting equipment for motor cars and boats on exhibition, among which are the C-S bayonet joint connectors, which can be depended upon to make a perfect electrical connection and will not jar loose, and the Nemo tail lamp.

Flash Auto-Lighter

The Flash Auto-Lighter is a system for automatically lighting or extinguishing acetylene headlights on a motor car from the driver's seat. The system is comprised essentially of three parts, a controller, an induction coil and a pair of special burners.

The controller combines in one piece a gas valve and an electric contact switch, both of which are controlled simultaneously. The coil is of the ordinary single unit type, and the burners are made to fit any standard lamps, and are fitted with sparking points properly arranged.



FLASH AUTO-LIGHTER FOR ACETYLENE HEADLIGHTS

The Frary Lighting System

The Frary Lighting system is another arrangement for lighting acetylene gas lamps from the driver's seat. It comprises a pressure regulator which reduces the gas pressure in the tank to 2 ounces; a burner or set of burners of special design with a primary coil wound around the stem of the gas burner which is used in connection with a pair of sparking rods to generate a magnetic make-and-break spark at the gas tip; and an automatic switch designed to be placed in the most convenient position for the driver of the car to operate from the seat, and which simultaneously turns on the gas and closes the electric circuit. When the hand is removed from the switch the electric contact is broken and lights left burning.

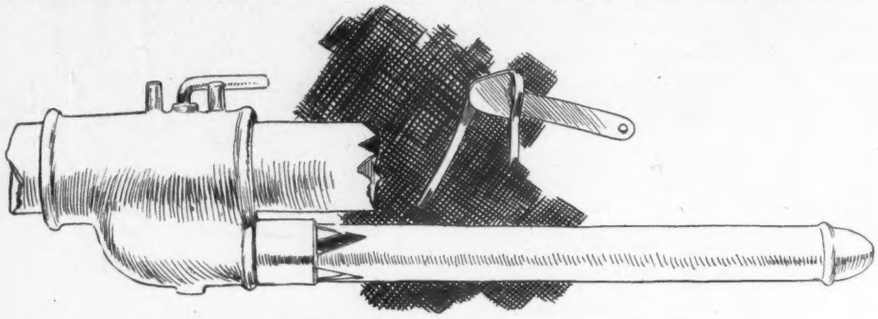
Scheu's Headlight Controller

Scheu's High-Low headlight controller is a device for controlling the headlights of a motor car, a device for instantly reg-

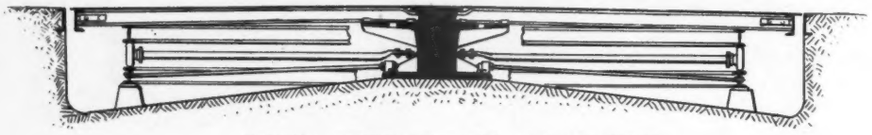
ulating the headlights to a high or low flame by simply turning a lever at the dash or heel board.

Globe Battery Boxes

In addition to its steel tool boxes and battery, the Globe Machine and Stamping Co., Cleveland, O., has a line of foot rests, robe rails, and brass handles for motor cars.



THE ACORN EXHAUST WHISTLE FOR MOTOR CARS



SMITH'S TURNTABLE FOR GARAGE USES

Bi-Plex Power Pump

The Motor Specialties Co., represented by the Motor Mart, Boston, has brought a new power pump for the inflation of tires, which is known as the Bi-Plex, which is unique in that it is driven by gas pressure from the cylinders of the motor, instead of from the flywheel or some other revolving mechanism of the car. It is simple and compact in construction, and a permanent fixture on the car which is always ready for instant use. The method of operation is to connect the hose to the tire and then open the two valves at the cylinder heads. This admits the gas from the engine to the pump through the pipes, and starts the action of the pump. The explosions of the engine cylinders act alternately on opposite sides of the pump piston, causing it to oscillate back and forth in step with the engine. As the pump piston is driven back and forth it draws in and compresses air at both ends and forces it to the tire.

Sage's Car Trunks

The Sage tire and travelling trunks made by the Sage Trunk Co., Boston, are well suited to traveling conditions. The circular tire trunk is made of black enameled leather, with hand-stitched edges, and harness leather straps. The Sage trunks are made of black enameled leather and harness leather. They are made to carry two or three suit cases, ranging in size from 28 inches long, 16 inches wide and 12½ inches deep, to 32 inches long, 17½ inches wide and 12½ inches deep.

The Homo Carbureter

The Homo Co. of America, Jersey City, N. J., in its Homo carbureter uses a rotating Homo turbine or mixing wheel in the top of the mixing chamber. The throttle governs the main air intake at the bottom of the mixing chamber and is not between the spraying nozzle and the motor. The theory of this is that the vacuum around the nozzle is properly utilized because liquids boil or gasify at high temperatures, but when the vacuum is increased around the nozzle the boiling point is much lower and the evaporation increases. This is claimed to aid in vaporizing low grades of gasoline.

The Victor Gas Tank

A new compressed gas tank for acetylene has been introduced which is made by the Compressed Gas Tank Co., Canton, which from all outward appearances is of conventional design, but whose internal construction is such that a greater storage space for gas is claimed, and the gas before entering the tank is subjected to a special purification process.

Autogenous Welding Equipment

The welding outfits of the Autogenous Welding Equipment Co., Springfield, Mass., are on exhibition; and by means of these outfits, broken aluminum castings, frozen cracked cylinders, broken frames, machine parts of all descriptions, stoves, bicycles, lawn mowers of any metal practically, may be repaired.

Smith Turntables

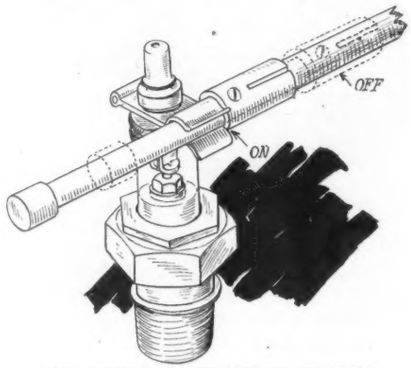
A steel turntable in operation with a motor car upon it is shown by the G. W. and F. Smith Iron Co., Boston. The top is of checkered steel on arms radiating from the center. The radial arms are on the cantilever principle from the central casting which contains the main bearing; and the table thus is one structure which turns on its center like a top upon its peg. The main bearing is entirely enclosed and free from the accumulations of dirt; and it is adjustable, with a special wrench which goes with each table, so that the whole top can be raised and lowered within certain limits. By this means small inequalities in foundations can be overcome and table kept to its proper level. This same adjustment can also be used to vary the effort required to turn the table.

Cutler-Hammer Switches

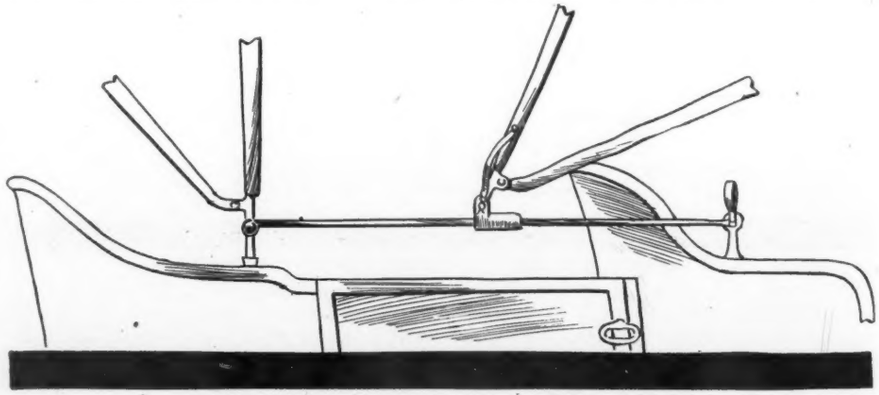
The Cutler-Hammer battery switch is a low-tension one with a current-carrying capacity of 10 amperes 80 volts. The illustration shows a single switch complete and also a rear view of a four-gang switch.

Ernst Turn-Table

The Ernst combined motor car turntable and wash rack, made by C. F. Ernst's Sons, Buffalo, N. Y., also is shown; it is not unlike the type previously described and the advantages claimed for it are: Cold weather has no damaging effect upon it; washing, repairing, and handling of cars is made easier with it; and it enables one to get two cars in the place generally required to get one in and out of the garage. These tables are made in two models, and in all sizes from 12 to 18 feet. in diameter. The construction consists of a heavy cast iron drum with a hardened steel resistance pin in the center, surmounted by a heavy cast iron top sup-



THE PHILLIPS TROUBLE FINDER



MURRAY TOP RAISER SHOWN AT BOSTON SHOW

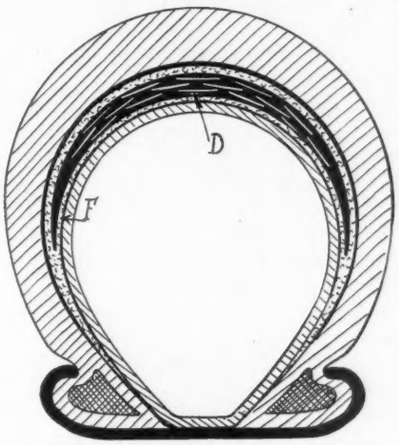
ported by and revolving on large hardened steel balls bearing is grooves cut in two heavy steel ball runs set in each casting. The steel floor beams are secured by a cast-iron clamping piece, held in place by a large king bolt and nut at the center.

Jelco Puncture-Proof Tire

The J. Ellwood Lee Co., Coshocton, Pa., is exhibiting a new armored tire known as the Jelco. Its puncture-proof or armored feature consists of a series of disks D arranged so as to overlap each other and vulcanized in a layer of rubber which is inserted and vulcanized between the rubber outer tread portion and the fabric, F, or body portion.

McClurg Zig-Zag Tread Tire

Another new tire is the McClurg zig-zag tread, which derives its name from the non-skid design of the outer surface of the



JELCO PUNCTURE-PROOF TIRE

rubber tread portion. Except for this feature the McClurg tire does not differ materially from other prominent makes of tires and it is made in all standard sizes.

Batavia Security Tread Tires

The Batavia Rubber Co., Batavia, N. Y., is showing a rubber anti-skid tire known as the Security tread, which is of conventional design except for the design of the outer surface of the rubber tread. Otherwise the tire is of conventional design and made in all standard American and millimeter sizes.

Vasco Windshield and Bumper

The Victor Auto Supply Mfg. Co., New York, is exhibiting the Vasco, Vasco 1912 and Vasco Zig-zag windshields and the Vasco bumper. By means of a friction disk and a one-hand control at the hinge between the two glass sections, the upper section of the Vasco shield may be made to rest in five positions. The Vasco 1912 is a three-way, one-hand-control windshield. The material construction is alike in both types; working parts are constructed so that steel works against steel; ball-bearing hinges are employed and the mechanism is encased in a dustproof case. The Vasco Zig-zag shield is designed for torpedo and roadster cars where the steering wheel is placed so far from the dash that a vertical shield will not give adequate protection. The frames of these shields are of slotted brass tubing filled with wood, and with the grooves lined with felt.

SAGE'S NO. 2X SUIT CASE TRUNK FOR MOTOR CARS

Whirlwind Glass Front

The Whirlwind glass front can be put in practically any position and is adaptable to almost any type of car without change in design or fittings. All fixtures of this windshield are solid brass castings. A tapered hinge construction, together with a high-tempered coil spring which is consealed, make the shield semi-automatic; and by a slight pressure from a thumb-nut the hinge is locked so that it will neither move nor rattle. The frame is made of drawn brass tubing, and of especially strong construction. The glass is ¼ inch thick with the two exposed edges polished and beveled.

Hoffecker Steady-Hand Speedometer

Five models comprise the speedometer line of the Hoffecker Co., Boston, manufacturer of the Stead-Hand speedometers. Model H is especially designed to meet the demand for a low-priced instrument, and it has a 3-inch face, a speed register for speeds up to 60 miles an hour, and a 50-mile trip odometer; Model K has a 3½-inch face, registers up to 60 miles an hour, and has a 100-mile trip odometer; Model D has a 4-inch face, registers up to 60 miles an hour and contains a 100-mile trip odometer; Model G has a 4-inch face, registers up to 90 miles an hour and has a 100-mile trip odometer; and all models have 10,000-mile season trip odometers. A model K combination set comprises the model K speedometer, a clock and an electric light attachment; and similar sets with model D or G instruments. The principle on which these machines operate is that of centrifugal force, having a balanced governor with all main bearings running on high-test steel balls.

Murray Top Raiser

P. A. Murray & Co., Newton, Mass., make the Murray top raiser. It enables one person to put up a four or five-bow top without danger of it digging into the body. It is a horizontal bar on which slides a sleeve to which the top bows attach. It is but necessary to hook the two front bows to the sliding sleeve and move the bows forward to the hooks at the end of the front seat, to which they attach.

Bilge Tire Pump

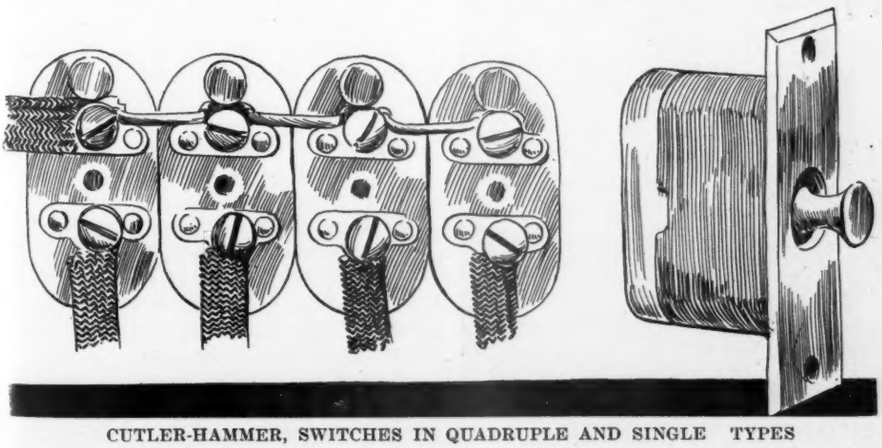
The Kinney Mfg. Co., Boston, makes the Bilge friction-driven tire pump. It is driven from the flywheel and is a single cylinder pump.

The Acorn Whistle

The Steel Cable Engineering Co., Boston, makes the Acorn exhaust whistle. It is made entirely of brass. The cutout valve is claimed to be self cleaning and allows of blowing the whistle as loud as desired.

Phillips Trouble Finder

The Phillips-Potvin Mfg. Co., Minneapolis, Minn., makes the Phillips trouble finder, which is a combination terminal and spark tester. By it the plug can be quickly cut out to aid in locating a miss in the motor. By cutting out any three cylinders it is possible to discerver if the four cylinder is firing or missing. In this way all four of the cylinders can be quickly tested.



CUTLER-HAMMER, SWITCHES IN QUADRUPLE AND SINGLE TYPES

Hoosiers Enjoy Their Big Show Week

Spring Celebration at Indianapolis Winds up With Banquet at Which All Make Merry—Outdoor Contests on the Streets Attract Many Spectators—New Models Displayed in Parade

INDIANAPOLIS, IND., March 6—Three hundred motor car tradesmen and their friends participated in a banquet at the Denison hotel Saturday night, thus closing the fourth annual spring opening and show under the auspices of the Indianapolis Automobile Trade Association. It was a merry gathering. Guests were shown to their seats by Will H. Brown, H. A. Townsley, W. H. Jordan, C. L. Stevens, Edward G. Sourbier and P. P. Willis, disguised in the uniforms of corner policemen. Just as the last of the seven-course dinner was being served a rural sightseer, represented by Harry Porter, wandered into the room and was taken care of by the corner policemen. Then Porter gave a humorous monologue of his experiences and concluded with a song.

The Friday Parade

The feature Friday afternoon was the parade of 1911 models, over a route 8 miles long. One of the interesting features was an Avery truck of 3 tons capacity, carrying 5 tons of print paper, belonging to the Indianapolis Star. In all 168 cars were in line. Leading the parade was the Indianapolis military band, followed by divisions, in which the following makes were represented: Premier, National, Marmon, American, Packard, Detroit electric, Waverley electric, E-M-F, Buick, White, Mitchell, Hupmobile, Maxwell, Columbia, Marion, Everitt, Franklin, Brush, Chalmers, Hudson, Stoddard-Dayton, Overland, Pope-Hartford, Inter-State, Winton, Ford, Mais truck, Cole, Westcott, Richmond, Auburn, DeTamble, Empire, Cadillac, Paterson, Peerless, Knox, Reo, Moon, Oakland, McFarlan, Oldsmobile, International, Grabowsky truck, Case, and Avery truck.

Owing to the condition of the roads leading to the Indianapolis motor speedway, the outdoor events Thursday afternoon were held in the North Capitol avenue boulevard, instead of at the speedway.

There were four classes, including skilled driving, electric car driving, women's driving event, and a truck event. In class A there were four events, including spearing iron rings attached to wire supports, a disrobing act, an egg and spoon contest, and an obstacle race, in which it was necessary to touch six barrels with either wheel in the sliding gear division and eight barrels in the planetary division. Class A summary: Bert Bronson, Overland, 20 points, won; Harry Knight, Westcott, 11 points, second; Everett Willsey, Pope-Hartford, 10 points, third; Clayton Pierce, Flanders, 7 points, fourth.

Class B, electric car contest: F. B. Willis, Studebaker, won; E. R. Vincent, Detroit, second; William Baker, Baker, third.

Class C, fancy driving for women drivers only, for quick stopping, dodging obstacles, etc.: Miss Helen Donson, Chalmers, won; Miss Gartsang, Marmon, second; Mrs. Bessie Wood, Hupmobile, third; Miss Bessie Hilton, Cole, fourth; Mrs. Ernest Dawson, Premier, fifth.

Truck Contest Interesting

In the truck contest, drivers were required to break toy balloons. R. A. Arnold, Overland, and M. Kelley, Frayer-Miller, tied for first place, breaking two balloons in 39 seconds; J. W. Cochrane, in a Whiteside, was third, and E. M. Sutherland, in a Detroit electric, was fourth.

The mardi gras parade on Tuesday night was a notable event, passing over a route 8 miles long. The parade was heralded by roman candles, and while passing red fire was burned by merchants along the way. There were two divisions, one for floral and the other for unique or grotesque cars. Winners were announced last week, a Buick coach winning first, and a Packard second in the floral division. In the unique division, a Mitchell, around which had been built a miniature street car, was first, and a Studebaker truck, carrying plantation singers, was second.

Some of the Features

One of the decided hits of the unique division was the Overland showing of twelve cars representing circus wagons. In these cages were grotesque animals, and nine clowns riding in test cars brought up in the rear.

The Ford company staged a knockout of the Selden patent, and a Hupmobile represented a motor boat. Mounted on a Flanders chassis was a monoplane, and Bertermann Brothers were represented by an immense dragon. The Studebaker company also staged a negro wedding that attracted much attention.

The Elks' lodge was represented by a minstrel troupe, while the Fisher Auto Co. staged the Newlyweds and their baby, Snookums. A touring car decorated in purple and white advertised Colgan's mint chips, and 50,000 samples of the gum were distributed during the parade.

One of the striking features of the floral division was a Cole 30, covered with purple, white and pink crysanthemums, above which was an electric sign.

The week was unqualifiedly a success. The number of sales however did not equal the number during the show last year, but it is believed many sales will result from the advertising done during the week.

WOMEN PARTICIPATE IN INDIANAPOLIS SHOW WEEK CONTESTS

INDIANS ATTEND A SHOW

Sioux City, Ia., March 6—The two shows closed here Saturday night after a triumphant week of big crowds, a large per cent from out of the city, and of many sales. Ideal weather assisted in making the shows all the more successful.

The show of the Sioux City dealers at the auditorium far surpassed that of last year in every way. This was the second annual show. The outside dealers held their show in the skating rink, and also were successful in drawing big crowds and many buyers.

Features of the show were the parades, in one of which the mayor rode, a large number of cars taking part. The demonstrators were kept busy from early daylight, and some of the overzealous ones were hauled into police court.

Among the outside visitors were some Winnebago Indians. One Indian purchased an $1,800 car and others examined the

new models carefully, considering buying them. Some of the Indians are quite wealthy, and if they get the craze the motor car is apt to supplant the mustang among the redskins. Local dealers, territory dealers and factory representatives were all highly pleased with the shows.

IOWA'S BIG SHOW EFFORT

Des Moines, Ia., March 5—The second annual show of the Des Moines Automobile Dealers' Association will open at the Coliseum here Tuesday and continue until Saturday night. Sixty-two exhibitors have reserved space and there will be seventy-five makes of pleasure cars and five makes of trucks. The affair has been advertised more than any motor show ever held in the state, and complimentary tickets for the entire week have been sent to every dealer in Iowa. It is thought the attendance from the state will be large, and the local dealers, most of whom have state agencies, are counting on doing a big business. The Coliseum, which is the largest convention hall in Iowa, has been turned into an Italian garden for the show. Decorations for the show will cost $5,000.

LOOKS GOOD FOR SYRACUSE

Syracuse, N. Y., March 4—Manager W. R. Marshall is still receiving applications for space at the third Syracuse show, though it all has been allotted for more than a fortnight, the show beginning March 14. T. F. Willis, a member of the show committee, took a long demonstrating trip out through the country this week and he reports keen interest on all sides. He says the farmers will be in in force to do some buying.

NEBRASKA WAKING UP

Lincoln, Neb., March 6—As a culmination of all of the good roads movements in the state in the last 3 years, the special committee of the two houses appointed to work up adequate laws has reported a set of five bills. The first of the set of bills provides for the creation of a state highway commission, to consist of the governor, attorney general and commissioner of public lands and buildings. The board is authorized to appoint a deputy engineer, who shall be a mechanical engineer skilled in highway construction. A board of deputy commissioners also is provided for, who shall act in an advisory capacity and shall receive only their actual expenses.

Another bill proposes a ¼-mill levy to be expended for a continuous state highway, the engineer being authorized to make plans for such a continuous highway. It is planned to spend this money proportionally in the counties in which it is raised, such work to be paid for one-half by the state, 15 per cent by a special levy against the abutting property owners benefited, and the rest from the county road funds. It is expected that the majority of the bills will pass.

Export Business Shows Big Increase

Federal Authorities Report That Nearly Twice as Many Cars Were Sent Abroad This January as in Corresponding Time Last Year—Imports for Same Month Fewer in Number

WASHINGTON, D. C., March 3—The exports of motor cars during January last were nearly double those of the corresponding month of last year, according to the latest government returns. The figures show that during January, 1910, the number of cars exported was 492, valued at $582,255, together with parts valued at $136,335, while in January last the number had increased to 924, valued at $969,930, while the value of the parts exported was $165,369. During the 7 months ended January the exports of cars rose from 2,868, valued at $3,795,952, in 1910, to 4,814 cars, valued at $5,845,222 in 1911. During these same periods the exports of parts, not including tires, jumped from $695,609 to $1,063,124.

Report on Exports

The comparative figures for the periods under consideration are as follows:

	January	
Exported to—	1910.	1911.
United Kingdom	176,806	194,589
France	30,366	31,342
Germany	6,292	3,731
Italy	13,970	30,000
Other Europe	18,875	20,071
Canada	269,111	439,706
Mexico	47,926	56,043
West Indies and Bermuda	68,236	61,788
South America	20,818	85,413
British Oceania	40,874	102,566
Other Asia and Oceania	18,156	73,583
Other countries	7,160	36,467

	Seven months ending January	
Exported to—	1910.	1911.
United Kingdom	1,060,464	1,177,625
France	318,270	246,546
Germany	104,515	158,467
Italy	25,761	81,927
Other Europe	132,553	347,798
Canada	1,627,804	2,435,955
Mexico	292,013	449,708
West Indies and Bermuda	248,932	241,184
South America	170,979	411,967
British Oceania	259,626	720,058
Other Asia and Oceania	168,976	475,636
Other countries	81,668	161,475

Sixty-Nine Cars Imported

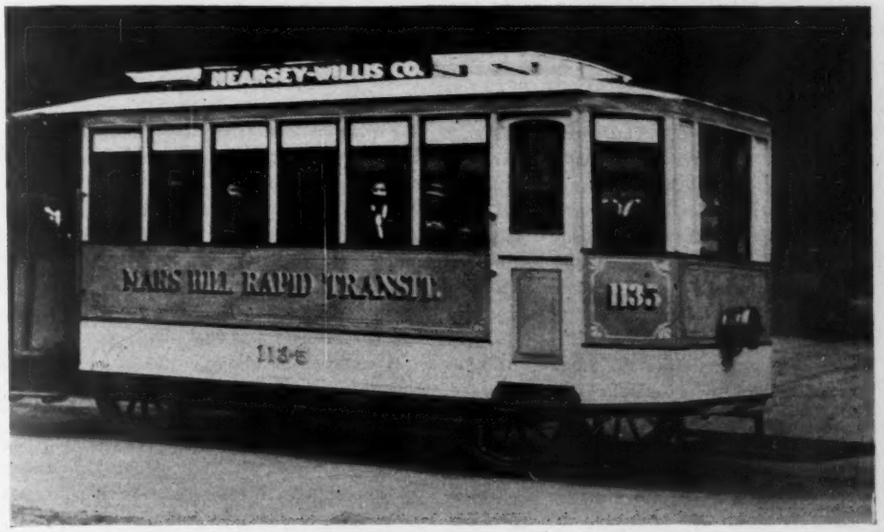
There were sixty-nine cars, valued at $137,727, imported into this country during January last, as against seventy-six cars, valued at $153,328, imported during the same month of last year. The imports of parts declined in value from $85,023, in January, 1910, to $33,574 in January last. During the 7 months' period the imports of cars dropped from 1,001, valued at $1,931,712, in 1910, to 545 cars, valued at $1,145,220, while the imports of parts, not including tires, likewise declined in value from $575,963 to $195,529.

During January last cars were received from the following countries: United Kingdom, eight, valued at $24,050; France, thirty-six, valued at $57,205; Germany, thirteen, valued at $34,041; Italy, seven, valued at $13,095; other countries, five, valued at $9,336.

IN GRAMM'S OLD PLANT

Bowling Green, O., March 6—The Bowling Green Motor Co. was incorporated last week with an authorized capital of $100,000 to take over the old plant of the Gramm Motor Car Co., which was abandoned about 2 months ago. The incorporators are well known business men of Bowling Green, Lima and Findlay. They are Stanley F. Sawyer, John B. Wilson, Fred C. Moore, F. Lee Roush, John W. Underwood and Thomas J. Miller.

Plans have been completed for the new company, which will manufacture light trucks of from 1,000 to 1,500 pounds capacity. Of the capital stock $50,000 will be issued at once and the remainder will be held in the treasury. The plans are to begin work with twenty-five or thirty men within 2 weeks, which number will be increased during the first 60 days to about seventy-five men.



MITCHELL AS MINIATURE STREET CAR IN INDIANAPOLIS PARADE

Gossip of the Motor Trade in Detroit

One Week Produces Orders for 400 Hudsons—Lively Demand for Commercial Cars—Several Concerns Elect Officers—Lozier Company Moving Its Forces—Bill Is Everitt's Assistant

DETROIT, MICH., March 6.—Another little touch of real spring weather such as prevailed last week is all that is needed to start the 1911 selling season off with a rush, it is declared.

General Manager R. B. Jackson, of the Hudson Motor Car Co., says the past week was a record-breaker, orders having been received for more than 400 cars, all for immediate shipment. One batch of thirty orders came from as far west as Redfield, S. D. The company has been shipping about forty cars daily. Hudson dealers in Sydney, Australia, report that their allotment or 33s is already sold and they are asking for more.

The Hudson company now has in its show rooms a unique exhibit in the form of the first car built by Howard E. Coffin, now chief engineer of the Hudson forces, 13 years ago. The car was bought from the owner and made the run to the factory under its own power.

C. R. Loucks, who has been engaged in the manufacture of motor sundries for some time past, has taken over the interests of the late Harry Nederlander in the Nederlander Auto Sales Co., Michigan distributor for the Haynes Automobile Co., and will continue the Haynes agency.

Commercial Demand Lively

An unusual demand for commercial vehicles continues to be the feature of the local market. The Alden Sampson Mfg. Co. shipped thirty-eight cars of various types, representing a value of $80,000, 1 day last week. The cars were consigned to New York, Boston, Chicago, Philadelphia, St. Louis, Buffalo, Cleveland, Atlanta, New Orleans, San Antonio, Los Angeles, San Francisco, Seattle, Kansas City, Omaha and Minneapolis. The Warren Motor Car Co. has received an order for forty 1,000-pound delivery cars from Battle Creek, Mich., eight of them for immediate delivery. The cars are to be used by the various branches of the C. W. Post Co., of Battle Creek. The commercial car department of the Packard Motor Car Co. is rushed with orders and heavy shipments are being made. The directors of the Packard have declared the usual quarterly dividend of 1¾ per cent on the preferred stock, payable March 15 to the stockholders of record at the close of business on March 9.

The Day Automobile Co., maker of the Day utility car, elected the following officers last week: President and general manager, Thomas W. Day; vice-president, Hugh Jennings, manager of the Detroit baseball club; secretary, George C. King; treasurer, John E. Murphy, manager of the Yellow Bonnet Taxicab Co. The company has received orders for ten cars and plans for manufacturing are about completed.

Huron Company Election

Stockholders of the newly organized Huron Motor Co., which has taken over the Detroit-Dearborn motor car plant, have elected officers as follows: President, J. F. Burns; vice-president, J. W. Reynolds; secretary-treasurer, J. F. Sughrow. The company is now turning out touring cars and roadsters in preparation for a promising season.

One of the interesting sights on the streets the past 2 or 3 days has been an Oakland car, mud-stained and otherwise showing evidences of hard travel. It came all the way from New York, the object of the trip being to demonstrate the utility of a new spring wheel, invented by Noah Cornfield, of this city. The wheel is designed to serve the same purpose as a shock absorber. The rim and outside plates revolve on ball bearings, and powerful compensating springs, built horizontally and vertically with the wheel, take up the shock before it reaches the axle.

The B. O. S. S. Co. has been organized for the purpose of manufacturing a car which is a combination of a touring car, a commercial vehicle and a roadster, the transformation from one form to another being a very simple process. The patents are held by Franklin Stratton and the principal stockholders are Frank A. Bowen, John A. Olson and Frank A. Smith. The capital stock is $250,000, of which $135,000 has been paid in. The office and factory will be located in Detroit. The car will be manufactured in three grades.

New Kind of Speedometer

The latest in motor accessories is a device known as the Renfro speedometer, an invention of a Detroit man, which is now being manufactured on a small scale in a factory on Bellevue avenue. It is designed to give an accurate report of the car's movements for every minute it is in use, showing the speed attained as well as the hours during which the record was made. The record is traced on a sheet of paper, the device operating somewhat on the principle of the instrument used by the government for keeping a record of the temperature.

Bill Is Everitt's Assistant

A number of changes are announced in the executive forces of local concerns. Harry L. Bill, formerly production superintendent for the Chalmers Motor Co., has been appointed assistant general manager of the Metzger Motor Co. He will be the direct representative of B. F. Everitt, president of the company, and it is understood he ultimately will relieve Mr. Everitt of much of the detail work that now devolves on him. Mr. Bill is regarded as an expert on production.

Lozier Company Moving

The transfer of the general offices of the Lozier Motor Co. from New York to Detroit is now under way. Sales Manager F. C. Chandler, his assistant, A. F. Frey, and Advertising Manager C. A. Emise were the first to arrive. They were followed last Friday by H. A. Lozier, head of the company. The rest of the executive force will reach Detroit Tuesday. About 80 per cent of the machinery has been installed in the new plant out on Mack avenue, and more than 900 men are now employed in production work. By the end of the month the plant will be in full operation, it is expected. Chief Engineer Perrin and his staff of factory assistants have been on the ground for some time.

CASE SUSPENSION REDUCED

New York, March 8—Special telegram—Commutation of the sentence imposed upon the J. I. Case Threshing Machine Co. and Lewis Strang, its racing manager, for failing to put in appearance at the recent race meeting at New Orleans, was made today after the case had been considered by the contest board. The original penalty was to have 1 year's disqualification for both company and driver, but, after hearing the evidence, the board reduced the sentence to 30 days in each case. As the disqualification took place as a result of a cause that accrued on February 24, the time will be up March 26, and the cars and driver will be eligible to compete in the Jacksonville races scheduled for the latter part of this month. The facts as they were presented to the board showed that Strang had been ill, and on account of his illness was unable to complete the racing cars. Because he was in full charge of the team and cars, the Case company did not take upon itself to notify the race promoters of the hitch in the arrangements, and affidavits from Strang were introduced to show that he was unable to do so. He did wire the promoters of his inability to start, but the telegram was only received the day before the meeting.

Other matters that were adjudicated by the board were as follows: The San Antonio International Fair Association, which staged an Oldfield race meeting after the ban had been placed upon that driver, was suspended for 3 months. The Ascot Park track also was given an extra penalty of 3 months for allowing an outlaw meeting on January 7-8, and all the officials and drivers were given that length of suspension. In addition to those who were suspended some time ago, for similar cause, Frank Chance, manager of the Cubs baseball team, who acted as starter, was given a year, and the same penalty was given the motor editors of the Los Angeles Examiner and Times, who acted in official capacities at the meeting.

James B. Ryall and Arthur Okeman, both of whom have been registered with the board, were suspended for 1 year.

Sanction has been granted to Guttenberg track, Indianapolis, and Amarillo, Tex., speedway, and the Louisiana and Texas Fair associations at Shreveport and Dallas.

The representative of the board, A. R. Pardington, who has been busy for a month preparing a national circuit for racing, passed through New York this week, and during his visit made a preliminary report of his findings to Chairman S. M. Butler. Mr. Butler stated that the full report will be made next week.

The tenor of the preliminary report was favorable and hopeful and it is considered as good as settled that the circuit idea will be realized this season. It is understood that enough signatures have been secured to insure the success of the project.

As far as the national reliability tour is concerned, the statement is made unofficially that the route will be from Washington to Ottawa and that the start will be in the latter part of June. The course may be by either of three routes. The first of these is by way of Philadelphia, Binghamton, Saratoga, Quebec to Ottawa, occupying 7 running days. The second is slightly shorter, crossing into Canada at the east end of Lake Ontario. The third is from Binghamton to Buffalo through the southern tier of counties in western New York, thence around the west end of Lake Ontario to Ottawa.

Chairman Butler is working upon a plan to secure the coöperation of all the race tracks in the country in a vast registration scheme. So far most of the big cities have joined the movement, particularly those for which tentative grand circuit dates have been arranged. The state of Pennsylvania has registered more ½-mile tracks than all the rest of the country combined, but Mr. Butler is making an earnest effort to secure a similar volume of registrations in other sections.

LOS ANGELES TRADE OUTLOOK

Los Angeles, Cal., March 4—Trade conditions in Los Angeles are good, but not what could be called brisk. Cars are selling and people show an inclination to buy, but the second-hand question is entering more and more into local market.

As there is now one motor car in southern California to every seven families, the demand is very well supplied, and one of the first questions in making a sale is "What can I get for my old car."

As in every line of business, there always will be motor car dealers who will complain about hard times. There are many of these in Los Angeles, but, at the same time, many of the dealers in standard cars report sales above those of a year ago. There is a growing tendency among dealers not to trade. Many of the leading firms now refuse second-hand cars, excepting those of the make they handle. Some even refuse such trades.

It is hard to say for which price cars there is the greatest demand in southern California. Of course, a great many more cheap cars are sold than high-price ones, but that has always been the condition. High-grade cars have sold this season, but the general verdict of the dealers is that the great demand is for cars under $2,000.

Los Angeles has too many agencies. Some are certain to lose money. Almost every make known can be bought here, and many of the people in the business have practically no knowledge of the industry.

The trade among the subagents continues well up to the standard. The ranchers of California always have been good motor car buyers, and many small towns of 5,000 population have 100 or more machines.

Without a doubt Los Angeles can claim the title of the greatest motor city in the world. The streets are black with cars at all hours of the day, and as the people motor 365 days in the year and will soon have 350 miles of the most perfect boulevards money can build there is no reason why it should not always be a motoring paradise.

One great advantage Los Angeles has which other cities never will have is the rapidly increasing population. It is estimated that an average of 3,000 people come to Los Angeles to make their homes each month. In a year this is 36,000, and out of this number there should be at least 2,000 prospects for motor cars. During the winter months many sales are also made to wealthy tourists.

This is a good territory for the motor delivery wagon and truck. While the number of trucks which will be used is limited, there are many retail houses putting in motor delivery service. The city of Los Angeles has just purchased five new motor-driven fire engines.

Meeting Gives Line on Future Shows

N. A. A. M. Advises Trade Not to Make Any More Exhibition Contracts Until its Committee Reports—Commercial Car Makers Prefer Demonstrations to Contests—Chicago's Profits

NEW YORK, March 4—According to the report made at the regular monthly meeting of the National Association of Automobile Manufacturers last Wednesday, presided over by President W. E. Metzger, the recent Chicago show netted the association a profit of approximately $45,000. This gives the N. A. A. M. a fund of nearly $90,000, which will be used to carry on its work in connection with good roads, contests, demonstrations, legislation, traffic regulation and control of shows.

Evidently the association intends to take action looking toward lessening the show burden of its members, as is shown by the following significant paragraph in the official report of the meeting: "In view of the demands being made upon manufacturers to take part in exhibitions, and particularly in exhibitions of commercial vehicles, it was decided to suggest to the trade that no contracts be entered into until the new show committee has met and discussed the subject fully. The show committee will meet on Wednesday, April 5."

In addition, a conference committee was appointed to discuss with the officers of the other car manufacturers' organizations all matters of mutual interest. This committee consists of the chairmen of the legislative, good roads and contest committees.

President Metzger, besides naming his standing committees, has created a committee on commercial vehicles, which at the present time consists of E. S. Kelly, S. D. Waldon and Walter C. White, who will select two more members. A significant change which shows the trend of the power-wagon makers is that which makes the contest committee the committee on contests and demonstrations, the change being due to the fact that demonstrations rather than contests will be promoted. H. O. Smith, W. T. White and Benjamin Briscoe are on this committee. The standing committees are as follows:

Traffic Committee—A. L. Pope, chairman; L. H. Kittredge, W. R. Innis.
Membership Committee—J. W. Gilson, chairman; S. T. Davis, Jr., Thomas Henderson.
Show Committee—Thomas Henderson, chairman; A. L. Pope, H. O. Smith.
Good Roads Committee—R. D. Chapin, chairman; S. D. Waldon, C. C. Hildebrand.
Legislative Committee—S. T. Davis, Jr., chairman; Benjamin Briscoe, Charles Clifton.
Auditing Committee—Benjamin Briscoe, chairman; S. T. Davis, Jr., Charles Clifton.

NEW ASSOCIATION MEETS

New York, March 8—Special telegram—Meeting for the first time since its organization, which was accomplished in rough form during the last week of 1910, the Automobile Manufacturers' Association of America assembled in New York yesterday. The meeting was held in the new quarters of the organization in the Day and Night building and was attended by a rather small number of representatives of the industry. President Campbell and several others heard the reports of the tentative committees, the chief of which was the one which has charge of the incorporation of the organization. The future of the association was discussed in some detail and trade conditions were considered from the viewpoint of the manufacturer. Adjournment was taken to a date to be selected some time in the future.

Best of the Speed Flock in Long Race

Thirty Nominations Received for 500-Mile International Event Which Will Be Run on Indianapolis Speedway May 30—Chicago Motor Club Plans Tour and Reliability Run to Meet

INDIANAPOLIS, IND., March 6—Thirty nominations have been received for the 500-mile race which will be run on the Indianapolis speedway on Memorial day. This represents the pick of the American flock with the foreign contingent yet to be heard from. March 1 represented the closing of the entries at the ordinary fee of $500 a car, but additional nominations may be made up to May 1 upon the payment of an additional premium of $250. The foreigners are expected to come in under this heading, negotiations now being under way to secure such European stars as Hemery, Lancia, Nazzaro, Wagner, Boillot, Zuccarelli, Goux and Rigal. The speedway has representatives in Europe at the present time trying to secure these entries.

The thirty entries now in hand include all but four of the leading drivers of the country—Burman, Lytle, dePalma and Mulford. It is expected, however, that these men will be lined up before May 1. Booked now are David Bruce-Brown, who has switched from a Benz to a Fiat, Harry Grant in an Alco, Joe Dawson in a Marmon, John Aitken in a National, Eddie Hearne in either a Benz or a Fiat, and several other notables.

Although the event is not to be run until May 30, already there are many applications for seat reservation. The Chicago Motor Club has notified the management that on May 29 it will promote a tour from Chicago to Indianapolis which will be in the nature of a contest for owners. The event will be run under grade 4 of the American Automobile Association's rules, which provides for time penalizations only, and which will be the same style affair as the New York-Atlanta good-roads tour of last fall. No one at all affiliated with the trade can take part in the contest, but everyone is invited to go on the tour. Cups will be given by the different concerns to owners making perfect scores. The Chicago Motor Club has sent out invitations to clubs in its vicinity inviting them to co-operate in making this a red-letter event.

HAYNES WILL REBUILD PLANT

Kokomo, Ind., March 6—Plans already have been made by the Haynes Automobile Co. to erect a modern and up-to-date plant upon the ruins of the one that was destroyed by fire last Tuesday. The machinery equipment already has been selected and it is expected the new plant will be in operation in 45 or 60 days. The company reports it is rapidly recovering from the effects of the fire. On Saturday, 5 days after the fire, the first cars built from the ground up after the conflagration, were completed and within 24 hours after the fire the motor building, motor testing, chassis assembly, body painting and body upholstering departments were in full swing.

"We have saved the blacksmith and drop forge departments, the motor testing and motor assembly departments, the spare parts department and the upholstery department, with all of the offices and experimental and draughting departments," says Sales Manager C. B. Warren. "In addition to this, the pattern vault was not damaged in the least and all of the patterns for the Haynes cars built in the past are intact. There were no completed cars destroyed in the fire, for everything has been shipped out of the factory as fast as completed. Production now is going on with comparatively little interruption."

PITTSBURG'S STRING OF SHOWS

Pittsburg, Pa., March 6—Pittsburg and vicinity has been stirred into enthusiasm as it has rarely been stirred before, in anticipation of 3 continuous weeks of motor shows. For the first time in its history the city is to have two shows, running consecutively from March 18 to April 8. The first show, which opens in Exposition hall March 18, is including an exhibit of aeroplanes. Surprising as it may seem, the Exposition building in Pittsburg has a larger main floor space and larger balcony area than Madison Square garden, and the show promises to be the largest ever held in Pittsburg. One of the unique features will be heating the entire building by electricity.

The Duquesne garden show has reserved a second week for motor trucks and also will show motor boats. Both shows are being liberally patronized by exhibitors. The exposition show management reports assignment of space to fifty-six manufacturers, some of whom probably will remove their exhibits to the second show.

HOPE FOR FEDERAL BILL

Washington, D. C., March 6—When congress meets in extra session on April 4, it is expected one of the first bills to be introduced with be the Wanger federal registration motor bill. The fact that the house committee on interstate and foreign commerce reported the bill favorably during the closing days of the last session has given the motorists hope and they will urge its enactment during the extra session.

MANITOBA ENACTS A LAW

Winnipeg, March 4—The Manitoba legislature, now in session, this week crushed most of the fanatical legislation passed in the last session and substituted amendments which will render the motor act of Manitoba thoroughly modern.

The chief amendment carried was one which provides that all chauffeurs be required to pass rigid examination before securing a license to operate a car. A government committee will be appointed to conduct examinations. The age limit is placed at 18 years.

Speed regulations within cities are to be turned over to civic control. Municipally owned cars are not to be charged license fees but must be registered. The fee on livery cars was materially reduced and now stands at $5 a car instead of

ENTRIES TO 500-MILE INTERNATIONAL SWEEPSTAKES RACE AT INDIANAPOLIS, MAY 30

No.	Car	Cyl.	Bore	Stk.	Displacement	Driver	Entrant
1	Case	4	4¼	5	284	Strang	J. I. Case Co.
2	Simplex	4	Special		...	...	Simplex Auto Co.
2	Inter-State	4	4¾	5½	390	Baldwin	Inter-State Auto Co.
4	National 40	4	5	5 1/16	447	Aitken	National Motor Vehicle Co.
5	Pope-Hartford	4	4¾	5½	390	Disbrow	Pope-Hartford Co.
6	Pope-Hartford	4	4¾	5½	390	Fox	Frank P. Fox.
7	Westcott	4	Special		...	Knight	Westcott Motor Car Co.
8	Case	4	4¼	5	284	Jagersberger	J. I. Case Co.
9	Case	4	4¼	5	284	Larsonneur	J. I. Case Co.
10	Stutz	4	4¾	5½	390	Anderson	Stutz Auto Parts Co.
11	Mercedes	4	5.1	7.1	583	Wishart	Spencer E. Wishart.
12	Amplex	4	5.5	5	443	Turner	Simplex Motor Car Co.
12½	Marmon	4	...	...	...	...	Nordyke & Marmon Co.
14	Marmon	4	Special		...	Dawson	Nordyke & Marmon Co.
15	Knox	6	...	...	...	Belcher	Knox Automobile Co.
16	Buick	4	5¼	6	594	...	Wadsworth Warren.
17	Buick	4	5¼	6	594	...	Wadsworth Warren.
18	Benz or Fiat	4	...	...	...	Hearne	Edward A. Hearne.
19	Alco	6	4¾	5½	579	Grant	American Locomotive Co.
20	National	4	5	5 1/16	447	...	National Motor Vehicle Co.
21	National	4	5	5 1/16	447	...	National Motor Vehicle Co.
22	McFarlan	6	3⅝	4	248	...	McFarlan Motor Car Co.
23	McFarlan	6	4	5	377	...	McFarlan Motor Car Co.
24	Jackson	4	4⅞	4¾	354	Ellis	Jackson Auto Co.
25	Jackson	4	4⅞	4¼	354	Cobe	Jackson Auto Co.
26	Jackson	4	5	5½	432	...	Jackson Auto Co.
27	Cutting	4	...	...	...	...	Clarke-Carter Auto Co.
28	Fiat	4	5	7½	597	Bruce-Brown	Davis L. Bruce-Brown.
29	Marquette-Buick	4	5¼	6	594	...	Dr. W. H. Chambers, McKeesport, Pa.
30	Firestone-Columbus	4	5	7	550	Frayer-Rickenbacher	Columbus Buggy Co.

$25. The license for motor cycles is reduced to $2 a year.

Special provision is made for the punishment of persons convicted of stealing cars for joy-rides, and it is now within the powers of a magistrate upon summary conviction to send such persons to jail for 6 months. Dealers will be required to send in monthly reports of all sales effected and the government inspector has authority to enter all garages for the purpose of observing whether or not the regulations of the act are being adhered to.

GET A LINE ON GUAYULE

Torreon, Mexico, March 4—The guayule rubber manufacturers of Mexico are making extensive preparations for placing the industry on a permanent basis. The fears that formerly prevailed that the shrub soon would become exhausted in the comparatively limited territory of which it is indigenous have been dissipated by the successful experiments that are being made in propagating the plant. It is found that it can be grown from slips and that it is of such a hardy nature that it requires practically no attention when it has once been placed in the ground.

The Intercontinental Rubber Co. and other large manufacturers of crude rubber in the Torreon district, are converting hundreds of thousands of acres of desert lands in the states Zacatecas, San Luis Potosi and Coahuila into guayule plantations. It is stated that there is enough of the wild guayule available to keep the factories running constantly for 3 or 4 years until the propagated shrubs attain a commercial size.

The guayule rubber industry is constantly growing in importance, and, it is reliably estimated, that this year's exportation of the product will exceed $25,000,000 gold in value. Upon some of the ranches enormous quantities of the shrub have been gathered and baled, and the bales are being held for an increase in price of the product. The new industry has brought almost fabulous wealth to many land owners of northern Mexico during the last 5 or 6 years.

CONTINENTAL STRIKE SETTLED

Muskegon, Mich., March 8—Approximately 350 employes of the Continental Motor Mfg. Co., most of them machinists, struck a few days ago, the open shop question being the issue. For a time the situation looked grave, but today it was announced that the strike has been settled and that the men will return to work. The strikers had demanded the reinstatement of all discharged men, including six dismissed February 25 and no discrimination against workmen who are, or who see fit to become, members of the Machinists' Union. This alleged discrimination is denied by the company and the workmen will vote on the question of reinstating the discharged employes.

English Seeking French Road Glory

Arrol-Johnston Enters Team in Boulogne Light-Car Race and Other Britishers Will Follow Suit—Opposition to Grand Prix Develops but Sarthe Club Is Banking on Germany and Italy

PARIS, Feb. 27—For the first time in the history of European motoring there is the possibility of a big British entry in a road race held in France. The event is the light-car race to be run at Boulogne-sur-Mer on Sunday, June 18, by cars of not more than 3 litres cylinder capacity, or four-cylinder models of 3 to 3½ inches bore. Arrol-Johnston, of Paisley, Scotland, has entered a team of three cars to compete against the Frenchmen, and it is confidently expected that other British firms, Argyll, Vauxhall, Calthorpe, and probably Star, will follow this lead.

Younger Firms Represented

At the present time the cars regularly entered are four each from Lion-Peugeot, Gregoire and Excelsior factories, and the team of three from Arrol-Johnston. The race has appealed to manufacturers to such an extent that it is confidently believed that sixty cars will line up on the seashore course next June, the racers coming from France, England, Belgium, Germany, Italy and Spain. It is interesting to note that the big firms—those concerns which supplied all the interest during the active racing season from 1900 to 1907, will not compete. There will be no Renault, Panhard, Darracq, Delaunay-Belleville, Brasier, Mors or Hotchkiss entries, although all these firms build the type of car for which this race has been organized. Their places will be taken by the younger and more vigorous firms, such as Gregoire, Sizaire, Alcyon, Rolland-Pilain, Delage, etc., in France; Hispano-Suiza in Spain; Fiat from Italy, and Opel and Benz from Germany.

French Oppose Grand Prix

In addition to this light-car race, undoubtedly destined to be the most popular sporting event of the year, there will be a grand prix de France into which the French firms refuse to enter. Notwithstanding this the Automobile Club of the Sarthe district still maintains that the race will be held, the explanation of its optimism being that it has in hand a private engagement by which one leading Italian firm and two important German factories guarantee to start, whatever the number of entries. It would certainly be unique if an international race should be held by a French club over French roads without a single French entry. Yet it is quite possible, for the old guard refuses to come forward, and the smaller and younger firms have neither the money nor the experience necessary for building cars of unlimited power.

The French government looks kindly on the race and already has intimated that no difficulties will be raised in the granting of the use of the roads. Indeed, it is quite possible that a special government prize will be offered in addition to the cash prizes offered by the Sarthe club.

FRANCE AWARDS OLD-AGE MEDALS

Paris, Feb. 27—The oldest motor car in France in active service is a 4-horsepower Panhard-Levassor, having a two-cylinder Daimler motor, which was turned out of the factory on December 4, 1891. Its present owner is Cure Gavois, of Renneville, in the Somme district, who has had the car in his possession for 16 years. The ancestor has been discovered in a competition organized by a French technical journal, and it is after verification of the date of construction that the village priest has been awarded a gold medal as the owner of the oldest car still in daily service.

The second on the list also is a Panhard, of 3 horsepower, in use since November 30, 1893. Peugeot claims the third and fourth places on the list of ancestors, but its oldest car, built in October, 1894, owns allegiance to the Panhard company, for it is fitted with a 3¾-horsepower Daimler motor. The second Peugeot, of 7 horsepower, has been in use since August, 1895. Fifth, sixth, seventh and eight positions on the list are all occupied by Panhard, with cars produced during the year 1897. Ninth in position is a 3-horsepower Georges Richard, sold on September 30, 1897, and now carrying a doctor on his daily rounds.

Panhard and Peugeot tie for honors in 1898, and in 1899 there are six cars, four of which were produced by Panhard, one by Mors and one by the F. N. Co., of Belgium. The youngest of the ancestral group is a 6-horsepower Panhard, which went into service as a touring car in 1900.

Although mechanical changes are few on the nineteen cars competing for the old-age medal, very many of them have undergone external modifications, and not a few having become too slow for passenger service are found useful for carrying goods. In addition to the nineteen on the official list there are three Panhards, one Serpollet and one Peugeot which have not been classed owing to the impossibility of determining their exact age.

TRUCKS AT AVIATION SHOW

Washington, D. C., March 6—In connection with the national aviation exposition, which opened tonight in the Exposition building, there is a dsplay of motor trucks. The attendance tonight was fair and the promoters are looking for increased numbers during the week. The truck exhibitors are as follows: Franklin, Capitol, Wilcox, White, Buick and Rapid.

The Readers'

WIRING A MASTER VIBRATOR

LOAMI, ILL.—Editor Motor Age—Through the Readers' Clearing House will Motor Age give a diagram of how to wire a K-W master vibrator on a 1910 Ford car?—C. A. W.

In Fig. 1 is shown the method of wiring a four-cylinder car with magneto and dry cells or storage battery. Where the battery is not used, as in the Ford cars, the terminal B on the master vibrator is not used. The vibrators on the dash coils must be short-circuited, as shown in Fig. 2.

CITES ECONOMY OF THE CAR

Chicago—Editor Motor Age—I have read several articles in the Readers' Clearing House columns in regard to cost of running a car and thought possibly my experience would be of interest. I bought a $2,000 car 8 months ago, and have run it a little over 10,000 miles, and my expenses have been as follows:

833 gallons gasoline at 11 cents	$ 91.60
Five extra tires	216.55
Oil and grease	12.30
Insurance	20.00
Repairs, tires, etc	20.10
Sundries, plugs, license, wheel tax, etc.	46.73
Depreciation, 20 per cent of cost	400.00
Interest at 6 per cent on investment	120.00
	$927.28

Figuring cost per mile the actual cash spent is $407.28, but figuring depreciation and interest it is $927.28, which I think is the only correct way. This is my fourth year, and I find it averages about the same each year.—A. B. Templeton.

MOTOR CYCLE IGNITION TROUBLE

Lewiston, Idaho—Editor Motor Age—I have a Curtiss two-cylinder motor cycle which is causing me considerable trouble and wish to ask if Motor Age can help me out on same. I was unable to get a good spark from the plugs and decided it was in the coils. I purchased a new Splitdorf coil for a two-cylinder motor but have been unable to get any results on account of both plugs sparking at the same time when the timer makes contact. Will Motor Age kindly send me a diagram of the proper wiring, or method of connecting this Splitdorf coil so as to make each plug spark as it should?—Ray Johnson.

In all probability you previously have been using two coils on your machine, or a coil for each cylinder, and have substituted a single coil for the two previously used and not changed the commutator or the cam. With this latter type of coil a single hump cam is used, and but one vibrator blade and point; with this it is compulsory that both plugs spark at the same time. Conditions in the motor are such that this does no harm. Motor Age suggests that you secure from the manufacturers of your motor cycle the necessary articles to make your ignition apparatus conform to the new type of coil.

ADJUSTING A MOTOR CAR

Sauk Center, Minn.—Editor Motor Age—There are a few things among the many when one is adjusting the machinery about a motor car that should be most carefully observed, and never forgotten, and that is in making an adjustment of a rapidly rotating shaft, gear or bearing; that to tighten it too much will, ninety-nine times out of 100, either cut the shaft or bearing, or which is most likely to happen, break it. I once had a young man adjust the bearing on the crankshaft end of the connecting rod and it cost me just $95.25 for his carelessness. He took the fiber shim out and filed it down too thin and then put it back into place, tightened the setscrew down so that it pinched the crankshaft when cold, and as soon as the motor, a four-cylinder, was started and got warmed up it broke the connecting rod, and this, getting loose, cut the cylinder and ruined the aluminum crankcase! It also cracked the crankshaft, which had to be replaced, as well as the one twin cylinder, and the whole bill footed up to the neat little sum as stated. The trouble was caused by not being careful when tightening a nut with a powerful wrench.

I was to blame to a certain extent in that I did not examine the adjustment after it was made, but I trusted to this repairman, who had never, it seems, adjusted such a bearing before and in all honesty thought it ought to be quite snug fitting or tight. Now, when I do this kind of work I file the shim or box to be adjusted very slightly and then try and see if there is any play or bind. If the latter, you must be careful to loosen the setscrew or nut until there is some little play, or, in other words, the bearing should be neither tight nor loose, but just so it will work nicely, not bind at any point, or rattle or pound when in fast or slow motion. If one has no experience in making such adjustments I want to say right here, after 6 years' experience in driving a car, get an experienced hand, one who really knows how to do the work in question, instead of one who thinks he knows how, and it will be money in your pocket every time.

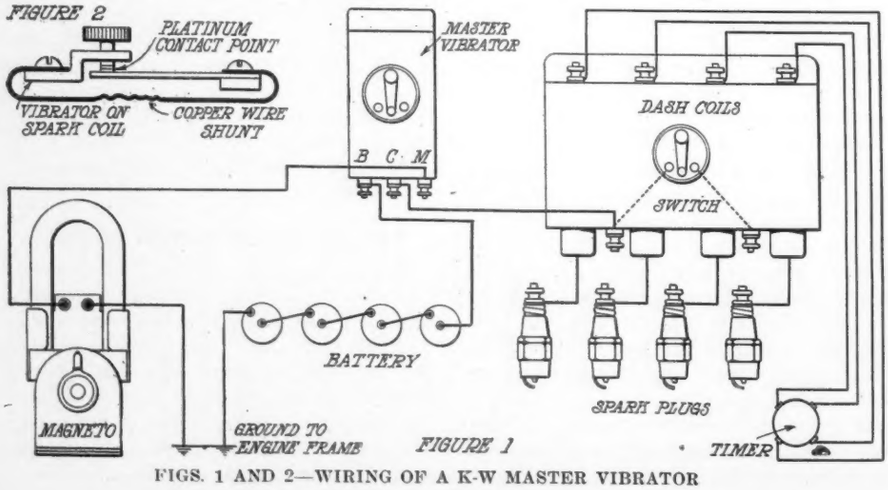
EDITOR'S NOTE—To the Readers of the Clearing House Columns: Motor Age insists on having bona fide signatures to all communications published in this department. It has been discovered that the proper signature has not been given on many communications, and Motor Age will not publish such communications, and will take steps to hunt down the offenders of this rule if it is violated.

The car as made to day is a very complicated and perfect, so to speak, kind of machine and will give the very best of service in constant use, provided it is used as designed by its makers, whereas if used to the contrary it is a most short-lived and expensive piece of machinery.

I have a fine four-cylinder car that has traveled many thousands of miles and never has been in the repair shop. I take care of it myself, see that it always is oiled and getting its oil, and that its adjustments are simply as perfect as when it left the factory, the result being a most satisfactory car in use and very inexpensive on the pocketbook.

I have had car drivers ask me how it was I kept my car in such fine running condition and not once in the repair shop. The answer is just one word, carefulness. Now, there are some drivers who will say this is rot, but I get as much, if not more pleasure out of this machine as they do out of theirs, and at one-eighth the cost.

Then, again, there are the tires to be considered, and while my 6 years' experience has proven many things in connection therewith, I must say this, that the tires will give the best of satisfaction if proper care and carefulness are constantly in the driver's mind. It has been proven to me that oil is the worst foe of rubber, and to allow the tire to stand for a moment in a puddle of it is to take one's ready money and throw it away. Then there is water, the foe of cotton fabric, that is the strength of the tire, and when oil gets to the rubber and water to the fabric your tire's finish is near. I have



FIGS. 1 AND 2—WIRING OF A K-W MASTER VIBRATOR

Clearing House

EDITOR'S NOTE — In this department Motor Age answers free of charge questions regarding motor problems, and invites the discussion of pertinent subjects. Correspondence is solicited from subscribers and others. All communications must be properly signed, and should the writer not wish his name to appear, he may use any nom de plume desired.

watched a careless repairman take his hands reeking with oil and replace in the casing a new inner tube, which at every place he touched with his hands was left on this new tube and to go on the inside of the casing there to dry. When I handle rubber I carefully wash my hands and then rub on them a little soapstone or French chalk, which is a friend of, instead of an enemy to, the rubber.

After each trip I jack up each wheel and carefully inspect it for little cuts or gashes, and if found I carefully wash out with gasoline and then put into same some good cement; then I carefully fill the place with some of the preparations now to be had and bind a piece of cloth around it as tightly as I can, letting it dry until I want to use the car again, the result of this treatment being that, by keeping the oil off and the water out of the tire, I have no blowouts and tires that look, after thousands of miles run, almost like new.

This much again for carefulness. When I run my car into its stall I have two wide boards that lie lengthwise and they hold the car until ready for another trip, and when not using for some time I partly deflate the tires and place under each axle a block so they will not touch the floor, thereby taking off from them the heavy strain they otherwise would be subject to, thus increasing the life of the tire. My wife can nearly always find me in the garage when she wants me, instead of some place where I should not be.

Now some, or all of you, who like the purr of the car engine, try these methods and see if they will not be of great value to you, and well worth the time spent reading them in Motor Age. Experiments are costly, but they prove facts.—A. D. Carpenter.

WEIGHT OF WINTON FLYWHEEL

Greenview, Ill.—Editor Motor Age—Through the Readers' Clearing House will Motor Age kindly answer the following questions:

1—What is the weight of the flywheel on the Winton six?

2—How many revolutions does the flywheel make between explosions on a four-cycle engine?

3—Leaving a car in a cold shed, will the cold affect the magneto or coil?

4—Where is the Corea motor made?—Merritt Williams.

1—The weight of the flywheel of the Winton six is 105 pounds.

2—On a four-cycle engine the flywheel revolves twice between successive explosions in any one cylinder.

3—It will not affect the magneto or coil to leave the car in a cold shed. It might, however, harden up the oil in the magneto enough to make it stick slightly when cranking if you start on the magneto.

4—Motor Age does not know of a motor by that name. The Correja is made by the Vanderwater Co., Elizabeth, N. J.

STALLING OF MOTORS

Champaign, Ill.—Editor Motor Age—Answer through the Readers' Clearing House the following questions:

1. In a gravity-feed system are stalled motors due to lack of gasoline in the carbureter, a common occurrence in climbing a hill.

2. What is the best way to repair a cracked waterjacket, the crack being about 3 inches long and rather irregular. —G. E. J.

1. This is not a very common occurrence, but in some cars using a gravity-feed system the motor will stop on a steep hill because the supply tank is lower than the carbureter. The motor may stop, however, when this is not the trouble, due to a clogged carbureter, loose connection in the ignition system or other cause.

2. See reply to Subscriber in this issue.

A QUESTION OF COST

Slate Center, Ia.—Editor Motor Age—Through the Readers' Clearing House will Motor Age kindly answer the following questions:

1—Which car can be run the cheaper, a 30-horsepower four-cylinder five-passenger, or a 50-horsepower six-cylinder four-passenger? It is claimed by some that it does not cost any more to run a large car in proportion to the passengers than a small one, while others claim it does. I would like to have the opinion of Motor Age on this.

2—Will electric lights in the headlights give good satisfaction if run by a dynamo and storage battery? Such lights have been installed in cars in this vicinity and some have given good satisfaction and others have not.—Roscoe Girton.

1—In general, it may be said that the 50-horsepower car will cost more to run per mile than the 30-horsepower car even when designed to carry fewer passengers. In the first place, the motor is heavier and usually the total weight of the car in the higher-powered class is greater in a four-passenger body than in a five-passenger car of the lower power. While the 50-horsepower motor probably would have a slightly higher efficiency, the advantage in this respect would not be great enough to offset the greater weight. These considerations will not hold true in all cases but are true for the average cars.

2—Electric lights give excellent service as headlights on a dynamo and battery system if properly installed and cared for. If the directions given by the manufacturers are followed no trouble need be feared.

SETTING TIMING GEARS

Manchester, Ia.—Editor Motor Age—I would like a little information through the columns of the Readers' Clearing House. I have a 1910 model 41 Overland, to which is attached a Remy magneto, type 5. The magneto was removed from the engine to adjust and clean, and while disconnected the shaft was turned so that when put back was found to be out of time. I would like to know how to set the gears to bring back to its original position and fire the charge when the pistons are at the upper center. Will Motor Age give plain instructions how to set the gears, etc.—A Reader.

You will find on the timing gears a small mark on a tooth of each. These marks indicate the teeth which should be set in contact for proper timing, and if the magneto and distributer is set properly the ignition will be correct. The method for the latter was shown in the Readers' Clearing House July 21, 1910, and further explained in this department for August, 1910. In case the timing gears are not marked it will be necessary to find the setting by trial.

BREATHER PIPE DESIGN

Spring Valley, Ill.—Editor Motor Age—Through the Readers' Clearing House will Motor Age kindly advise me how I can put a breather on my two-cylinder opposed 5 by 5 four-cycle motor? When I purchased it there was no breather on it and

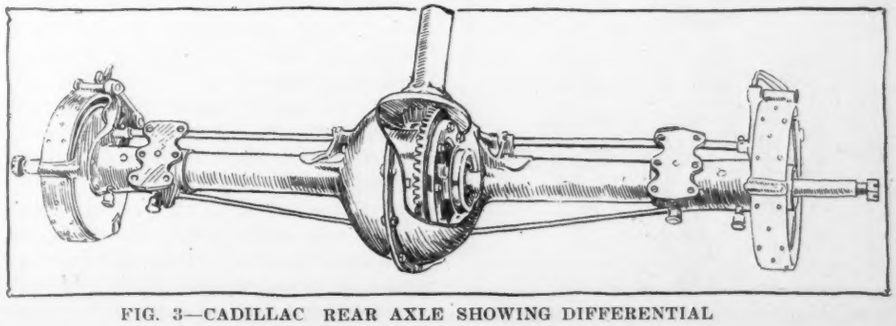


FIG. 3—CADILLAC REAR AXLE SHOWING DIFFERENTIAL

I am burning out my connecting rods. I tried a breather, but it shoots the oil out of the top.—W. F. Gunther.

The trouble with your breather pipe seems to be that of having the oil shoot out of the top. This can be avoided in two ways, first by using a very long pipe and second by a short pipe with staggered baffle plates arranged within it as illustrated in Fig. 5. The oil strikes on these baffle plates and flows back into the crankcase.

LUBRICATES THROUGH GASOLINE

Havana, Ark.—Editor Motor Age—Advise me if it is good policy to put lubricating oil in the gasoline tank of a Ford model T. If so, about what quantity would be sufficient? I have been using lubricating oil in the gasoline tank in addition to the regular oiling system on a twin Thor motor cycle and it seems to make the engine work better. Advise if any harm can be done by continuing the use of it in quantities of about 4 ounces to 1 gallon.—J. E. Mitchell, Jr.

To mix cylinder oil with the gasoline, in the quantities mentioned, should do no harm other than to, perhaps, increase the accumulation of carbon on the walls of the combustion chamber and piston head; whereas a decided improvement in the lubrication of the motor with consequent improvement in its operation may be obtained. The mixture of cylinder oil with gasoline comprises the entire lubricating system of many two-cylcle motors now in use in motor boats.

ONE LAMP VIBRATES

Hollywood, Cal.—Editor Motor Age—Through the Readers' Clearing House will Motor Age aid me in the following: The oil lamp on the right-hand side of my car begins to vibrate when the speed of 20 miles an hour is reached. It vibrates so much that the slide fastening presently jars up and out, and the noise is very unpleasant. At 25 miles an hour the vibration ceases. Bolts, bracket, and lamp are all tight, and I had the plate by which the lamp is attached to the bracket—which is riveted to the lamp—well soldered, without effect.—C. W. Bowman.

It is almost certain that the bolts in the lamp, bracket or some connection between them are loose. If the vibration were due to road shocks or excessive vibration of the engine the trouble would probably be noticeable in both lamps. You might try welding all loose parts. The vibration may be due to air currents that are deflected against it up to these speeds, but which currents at higher speeds are deflected clear of the lamp. Cases of this kind are on record. If you were to submit a sketch showing the kind of dash on your car and to what the lamp bracket attaches it would be possible to give more accurate information. There is such a thing as synchronized vibration, between the lamp and car part, and until this is set up the lamp will appear to vibrate by itself.

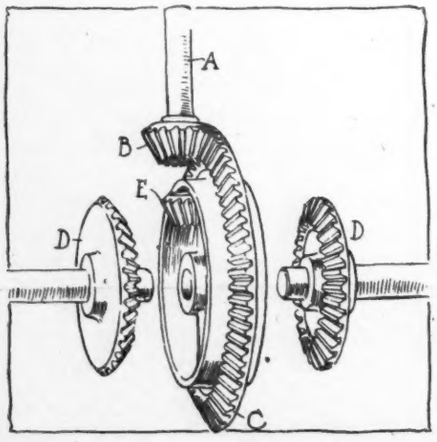


FIG. 4—SIMPLE BEVEL DIFFERENTIAL

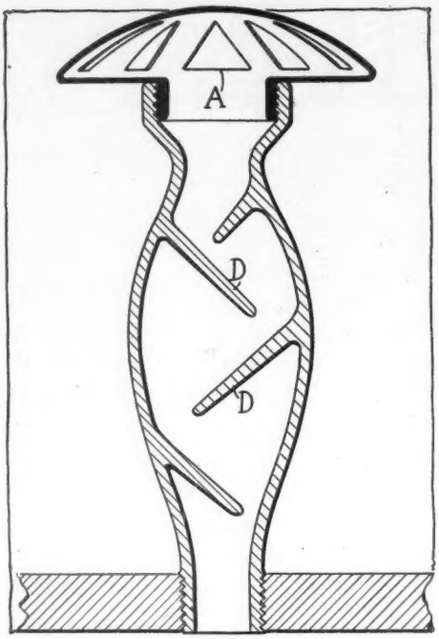


FIG. 5—DESIGN FOR BREATHER PIPE

WEAR OF FRONT PUSHRODS

St. Ansgar, Ia.—Editor Motor Age—Having read the various opinions concerning the greater wear of front pushrods, and failing to find one giving the correct reason, I beg to state that I have found the same to be due to dust and dirt which comes through the radiator. Due to the shape of the engine, the dust-bearing air is deflected from all but the front pushrod, where it lodges, causing cutting and rapid wear.—Guy B. Carroll.

PETROL AND GASOLINE SAME

Detroit, Mich.—Editor Motor Age—I noticed with considerable interest that the Commer car, which is being manufactured in Kingston, N. Y., makes an average of about 7 miles per gallon of petrol. Will Motor Age please advise, through the Readers' Clearing House, whether there is any difference between petrol and gasoline, as to its combustion qualities that would make this difference in mileage. Also any further information Motor Age is able to furnish that will be of interest will be appreciated. I have heard it said that English carbureters are so far superior to those made in this country that with either petrol or gasoline used as fuel, greater mileage per gallon could be obtained.—C. L. Shedd.

Petrol is the word used in England in place of our word gasoline, and refers to exactly the same fuel. Whatever superior economy is shown by motors of British design is due to the motor and carbureter and not to the fuel used. Cars in Europe will show slightly better mileage per gallon of fuel on account of the better roads. In Europe the fuel economy factor has been more to the front, because in France there is a tax on every gallon of fuel used, which makes the price three times that in America. Where the fuel price is raised the economy factor will receive more attention.

REPAIRING WATERJACKET

Illiopolis, Ill.—Editor Motor Age—Through the Readers' Clearing House will Motor Age kindly inform me how I can stop water leaks caused by freezing in the rear cylinder of my two-cylinder 1909 Reo.—Subscriber.

If the crack in the waterjacket is not too large it can often be closed by rusting with a solution of sal-ammonia. Fill the jacket with a 50 per cent solution of sal-ammonia and allow it to stand about 48 hours. The crack may be too large for this treatment, in which case it can usually be welded by the oxy-acetylene process. In this process the adjacent faces of the metal are melted and run together as one.

WANTS LOWER GEAR RATIO

Woodstock, Ill.—Editor Motor Age—Will Motor Age kindly answer through the Readers' Clearing House the following questions:

1—What is the horsepower of the four-cylinder Cadillac engine, No. 10221, serial No. 5314? It has a planetary transmission with three speeds forward and one reverse. What year was this car built?

2—I desire to use this car for touring purposes and as I am in a hilly country wish to reduce the speed and develop pulling power. How would Motor Age advise me to do this? Would it be necessary to get a new differential geared lower, or could this one be altered?—W. W. Kemy.

1—Motor Age has no means of identifying a motor from its factory number and suggests that you communicate with the manufacturers.

2—The differential proper cannot be geared lower, but the ratio between the propeller shaft speed and that of the rear axle can be changed by lowering the gear ratio of the bevel gearing. While this gearing is located on the differential it is not a part of the differential. In Fig. 4 is shown a dissembled view of the simplest bevel differential gear and its connections, and while not the type used on the Cadillac will serve to bring out the points that it is desired to make. In this illustration

A is the propeller shaft, B is the driving pinion, C is the driven gear on the differential housing and the gears marked D and E are parts of the differential. In order to lower the speed ratio it would be necessary to increase the size of the gear C. This would involve moving the gear B toward the front of the car. But the bearings of the shaft are so close to the gear B that this would be very difficult. An illustration of the Cadillac rear axle is shown in Fig. 3 with the differential and bevel driving gears exposed. By far the best method to change the speed ratio of the car is to obtain from the factory a new rear axle with the ratio desired.

REAR AXLE QUESTIONS

Jewell, Ia.—Editor Motor Age—1. Through the Readers' Clearing House will Motor Age illustrate or explain the following: The difference between a live axle and a semi-floating axle? 2. Was the rear axle used on the 1910 model 10 Buick a semi-floating or live axle type? 3. Does the Timken Axle Co., of Detroit, manufacture any other type of axle than their floating type?—R. W. D.

1. A semi-floating axle is a live axle. All axles which turn are called live axles to distinguish them from the stationary or dead axles in which there is no rotating part. Dead or stationary axles are used with side-chain drive. Live axles are divided into the floating and semi-floating types and the difference between them was explained in the Readers' Clearing House, Motor Age, for February 16, 1911.

2. The rear axle on the 1910 Buick Model 10 is of the semi-floating type.

3. The Timken rear axles are made in both floating and semi-floating types.

KNOCK IN AN E-M-F

Marlow, Okla.—Editor Motor Age—Through the Readers' Clearing House will Motor Age kindly answer the following questions:

1. Tell me what is the matter with an E-M-F car which has the same trouble as that described in Charles L. Fawcett, of Smith Center, Kan., in Motor Age, issue November 3, page 20. I have looked at the nuts which fasten the engine to the frame and tightened these nuts as tight as possible, but this failed to take the knock out of the engine.

2. Where can I get a good book on the repair of magnetos, coils, and timers of different makes?

3. Give a good route from Marlow, Okla., to Kansas City, via Wichita and Pittsburg, Kan.—Reader.

1. Without knowing more about the location of the knock it is impossible to give you any other directions than were given in answer to the inquiry to which you refer. If you will try to locate the knock as outlined there Motor Age can probably help you further.

2. A good book on the subject of ignition devices is Ignition, Timing and Valve Setting, by Russell, which can be obtained from Motor Age for $1.00 in cloth, or $1.50 in leather binding.

3. From Marlow go to Oklahoma City, thence through Britton, Edmond, Guthrie, Mulhall, Orlando, Enid, Kremlin, Pond Creek, Medford, Renfrow, Caldwell, Drury, South Haven, Wellington, Riverdale, Peck and Wichita. At Wichita Motor Age suggests that you call at the Wichita Automobile Club for a route from Wichita to Kansas City via Pittsburg.

NOTICE

Motor Age has received communications addressed to the Readers' Clearing House from the following named towns and nom de plumes:

Seattle, Wash.—H. L.
Cincinnati, O.—A Reader.
Duluth, Minn.—A. F. C.
Council Bluffs, Ia.—J. L.
Lawton, Okla.—A. B. C.
Charleston, Ill.—Subscriber.
Martelle, Ia.—A Subscriber.
New York—A Subscriber.
Hartford City, Ind.—Coll.
Denver, Colo.—A Subscriber.
Roseland, Nebr.—A Subscriber.
Chicago—Reader.
Vincennes, Ind.—Chalmers 30 Driver.
Vancouver, B. C.—An Interested Reader.
New Richmond, Wis.—T. C. M.
Chanute, Kan.———
——— A. A. H.
Hazelton, N. D.—A Reader of Motor Age.
Ladd, Ill.—A Reader.
Sheldon, Ill.—Henry.
——— O. A. P.

These communications will be held until the proper signatures have been received.. All communications written over a nom de plume must bear the writer's signature, otherwise such communications will not be answered. These signatures are wanted as proof of the authenticity of the inquiries.—Editor Motor Age.

TO LENGTHEN VALVE STEMS

Greenview, Ill.—Editor Motor Age—I am sending herewith a sketch, Fig. 6, showing a method which may be of assistance to others in drawing out or lengthening the valve stem when there is no means provided for adjustment. Take a round punch, lay it under the valve under the key hole, place both on the anvil, then put another round punch or round piece of steel over it and hammer the steel, moving it around the valve stem until the latter is drawn out to the proper length. I have found that this will last well and will not injure the push rod.—Merritt Williams.

LAYING UP A STORAGE BATTERY

Terre Haute, Ind.—Editor Motor Age—Through the Readers' Clearing House will Motor Age kindly tell me how to store my Vesta storage battery for 8 or 9 months so that the battery will not become destroyed.—E. W. Bundy.

To prepare the battery for storing several months it must first be fully charged, the current being continued at the finishing rate for an hour after the specific gravity of all the cells has stopped rising. If there are any low cells in the battery they should be put in condition before the charge is begun. When the charge is completed disconnect the cells, remove the covers and take out the elements. Spread the plates a little and take out the separators, spraying a stream of water on them at the same time, after which they may be laid aside to dry. If the spongy lead on the negative plates sticks out from the grids, press it back into place. The positive plates are now ready to be put away. If the negative plates start to steam while drying wash them in water and let them dry thoroughly. When they are dry immerse them in electrolyte of 1.275 specific gravity. Wash out the jars as soon as the cells are dismantled and rinse the rubber separators before putting them away. It is better to discard the wooden separators entirely, but they can be used again if kept in water and transferred directly to the electrolyte when setting up the battery. To put the battery back into commission treat it just the same as if it were a new one and no trouble will be had.

LOOSE PISTON ROD

Galena, Ill.—Editor Motor Age—I purchased a new car last summer, and after running it for 3,500 miles I found there was a considerable rattle in the engine when running idle or running down grade on high speed. I have taken out the engine and find about one-eighth inch side play of piston rod bearing on the crankshaft. I also find a trifle over one-eighth inch side shake in the piston wristpin, to which the top of the piston is fastened. I find there is no play up and down in the piston-rod bearings. As the crankshaft bearing of the piston rod has worn very smooth and having this one-eighth inch play on the top and the bottom, the piston rod bearing on the crankshaft flops from side to side when the engine runs idle, causing this rattle. Let me know through the Readers' Clearing House if it would be advisable to take up this side play on the piston wristpin, which I know would stop this rattle. If it is not advisable to do this, kindly suggest some method to remedy this annoying trouble.—O. K.

This play should be taken up as soon as possible, for if not remedied now will only grow more annoying. The bearing can be adjusted by putting in new shims between the end of the rod and the cap. These shims are usually thin sheets of copper or other metal. If no provision was made for these the only method of adjustment is by procuring new bushings for the bearings, which can be had at small cost.

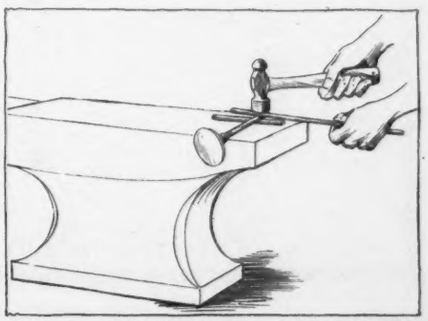
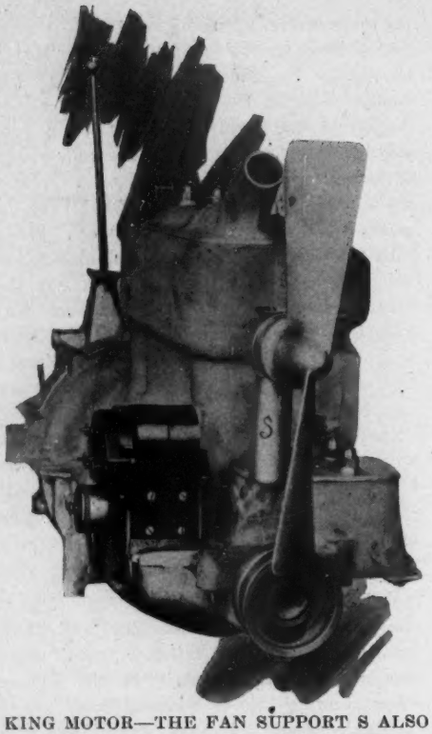


FIG. 6—LENGTHENING A VALVE STEM

King Latest Detroit Car to

New Car Incorporates Many European Ideas, Such As Long-Stroke Motor, Unit Power P... Thermo-Syphon Cooling, and Only Has 411 Parts ... Told in Its Construction



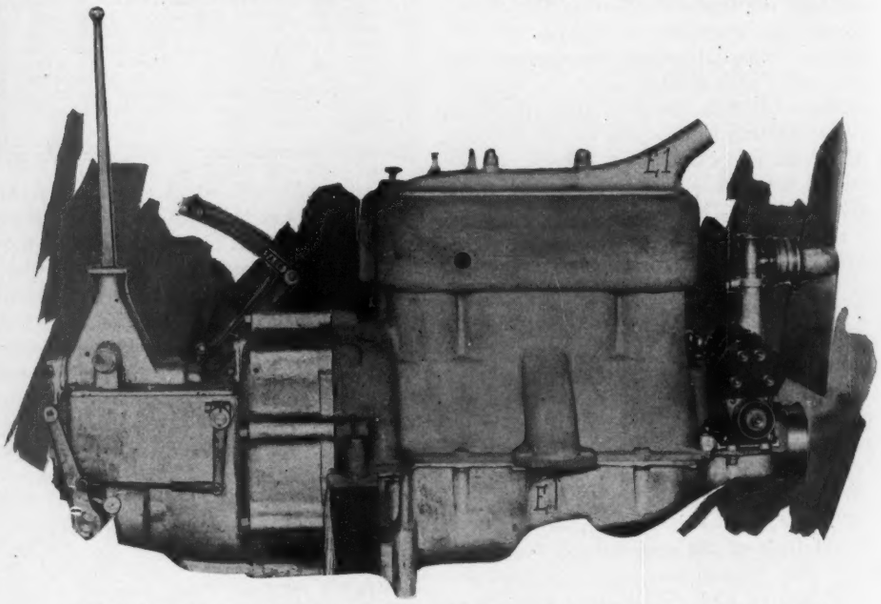
KING MOTOR—THE FAN SUPPORT S ALSO SERVES AS AN OIL FILLER PIPE

DETROIT, Mich., the real hub of the motor car industry, has had another adjunct in the King 36, built by the King Motor Car Co., a corporation with a $500,000 capitalization. The King takes its name from its designer, Charles B. King, who has been associated with the industry since its inception, the old Northern being one of his creations. He has been abroad for 2 years studying the car field and this car is the outcome of his efforts. It partakes largely of European design in many respects.

Simplicity has been the point aimed at and it is stated by actual count that there are exactly 411 parts that enter into the makeup of the car.

Unit Power Plant

As might be expected, the King motor is a unit power plant, combining as it does an enclosed multiple-disk clutch and a three-speed selective gearset. It carries many European earmarks, among which might be noted casting of the four cylinders in one piece and also having ... per part of the crankcase an integral ... tion; but the designer has gone still further, in that the intake water pipe E is a unit with this casting, the upper or return water pipe E1 forming a plate covering the entire top of the jackets. An example of simplicity in this car is seen in the illustration of the left side of the motor in conjunction with the intake manifold. The carbureter draws its air supply, which is heated, through a pipe A, the air entering this pipe back of the rectangular plate, which encloses the valve stems and also forms the Y-shaped intake manifold.



KING MOTOR—E IS THE INTAKE WATER PIPE, E1 THE RETURN PIPE

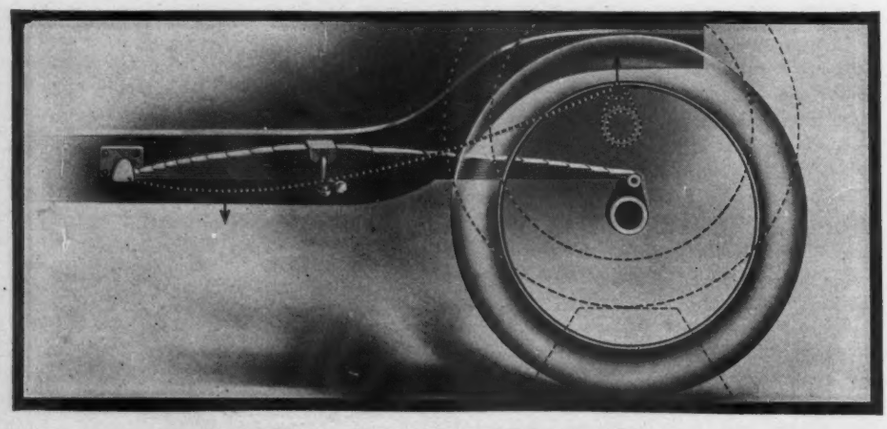
A still further feature, which suggests the European lines of this motor, is the transverse shaft at the front on the right end of which is carried the 1911 magneto for the dual ignition system. The magneto is supported direct on a bed piece, which is a part of the crankcase.

Simplicity a Feature

Much more could be said about the simplicity of the King power plant, but the internal features must not be neglected. As natural, it is a leader in the long-stroke type, this being one of the pronounced European tendencies of today. The cylinders are $3\frac{3}{16}$-inch bore and $5\frac{1}{8}$-inch stroke. The crankshaft is a two bearing type, with 18 inches between bearings. The shaft is $2\frac{1}{8}$ inches in diameter. The other parts of the motor are made equally strong. The valves are all located on the left side and are located on an angle to allow the charge to pass directly into the cylinders, or to exhaust directly out of them without travelling through any long passage. All valves are $1\frac{13}{16}$-inch diameter in the clear and the valve springs are enclosed in boxes to reduce noise, as well as forming a dust-proof chamber. The exhaust manifold is exceptionally large, as shown in one of the illustrations, its exit being noted at X.

The lubrication of every new motor is an important factor. In the King system the encased flywheel is used to carry the oil to an elevated trough, which in turn delivers it to all the bearings. Suitably inclined channels are used to return the oil to the flywheel reservoir. A novel feature of the oiling is that the fan support S is a tubular construction and serves as an oil filler for the crankcase.

As customary with many European motors of this type, thermo-syphon cooling is

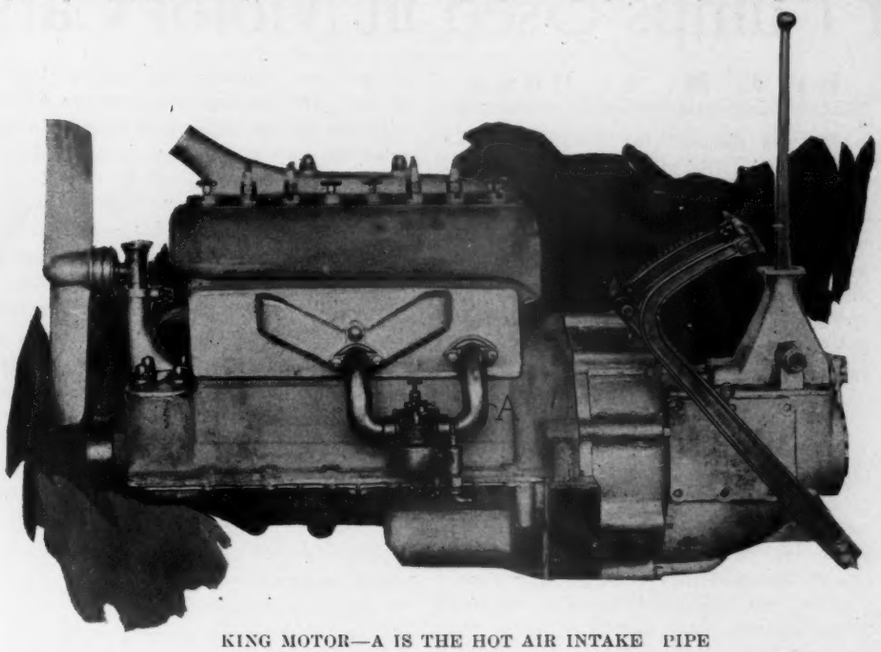


KING CAR—LEVER TYPE OF REAR SPRINGS

Be Put on Motor Market

One of the Features of New Car Is Placing of Clutch and Brake Control Pedals on Left Side, Clutch Being at Outside and Brake at the Inside—Other Features Are Also Included

used. But it is not entirely with the motor that the King simplicity centers. It is found throughout the clutch and gearset as well. The clutch is a multiple-disk construction using all steel disks, which are hardened and ground, and which disks operate in oil. The gearset is a selective type with the gear shift lever carried on top of the gearbox. This control is of special simplicity when it is remembered that the steering wheel is on the left side, so that the gear shift lever is operated by the right hand. The lower end of this lever is able to engage direct with the shifting parts, thereby eliminating toggle joints and rocker shafts.



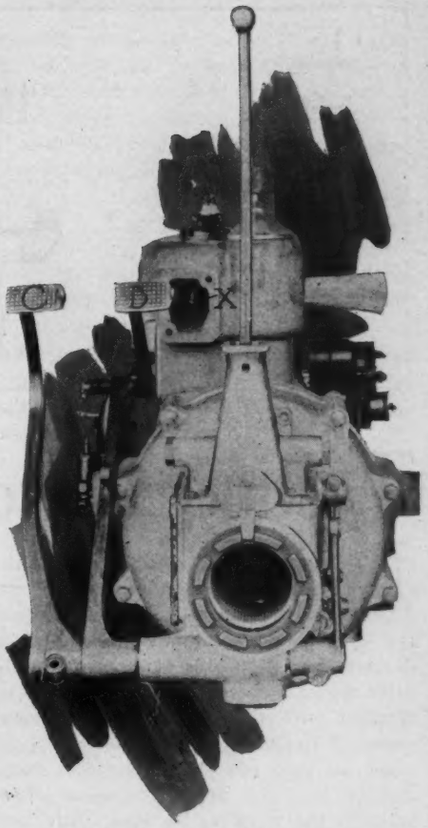
KING MOTOR—A IS THE HOT AIR INTAKE PIPE

Control on Left Side

The clutch and brake control pedals are on the left side, the clutch being at the outside and the brake at the inside. Both sets of brakes are operated by pedal, and on the brake pedal B is a locking ratchet by which the brakes are held applied when the car is standing. The brake drums are 14 inches in diameter.

Transmission of power from the gearbox to the rear axle is through a propellorshaft enclosed in a torsion tube and having but one universal joint located at its forward end. The rear axle is a floating type with Hyatt high-duty nickle steel bearings, and annular ball bearings used at some points. The axle driveshafts, 1⅜ inches in diameter, are squared at their inner ends where they enter the differential.

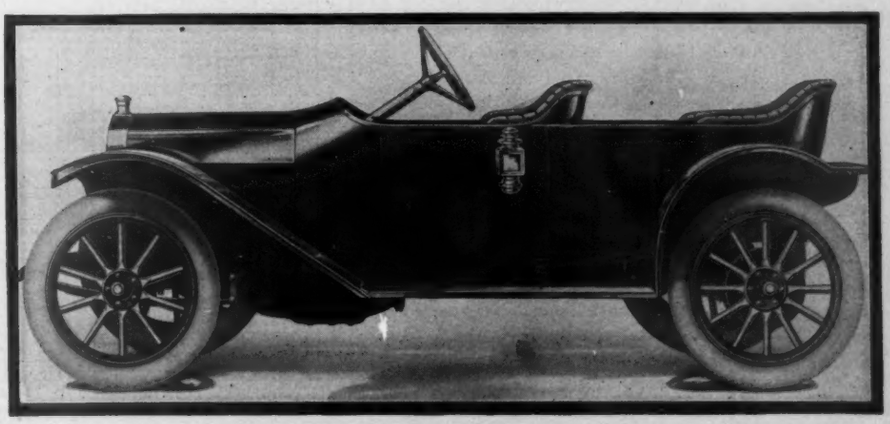
The running gear of the King car centers about a pressed steel frame of such length that a 115-inch wheelbase is used. This frame has the usual drop in front of the rear axle and is supported in front by semi-elliptic springs and in rear by a new patented spring design which incorporates a shock absorber effect. As illustrated, the spring is pivotally supported near its center to the frame. Its forward end is also supported on the frame. The rear end operates in shackles mounted on the rear axle. The spring being practically straight, side swing is eliminated. In meeting road obstacles an upper spring action is apparent on the rear end, and this action is taken care of by a downward spring tendency encountered between the trunnion and the forward bearing support of the spring. The greater part of the spring shock and its recovery are absorbed between the trunnion and this forward support, thus taking from the body the majority of the shock. This spring principle is similar in effect to that used on Pullman coaches.



KING MOTOR—X. EXHAUST PIPE, C. CLUTCH PEDAL AND B BRAKE PEDAL

The front axle is a channel type pressed steel design reinforced by drop forgings. It is hung at an inclination of 7 degrees forward, thereby making the road shocks more directly in line with the springs and at the same time inclining the steering spindles to a point where, it is claimed, easier steering is obtained.

The King touring car is fitted with 34 by 4-inch tires. The standard body color is dark blue with silver gray running gears. It is expected that deliveries will be started late this spring. In addition to a touring car body, made with or without fore doors, a choice will be given of a runabout and a coupe.



KING CAR—FOREDOOR TOURING TYPE

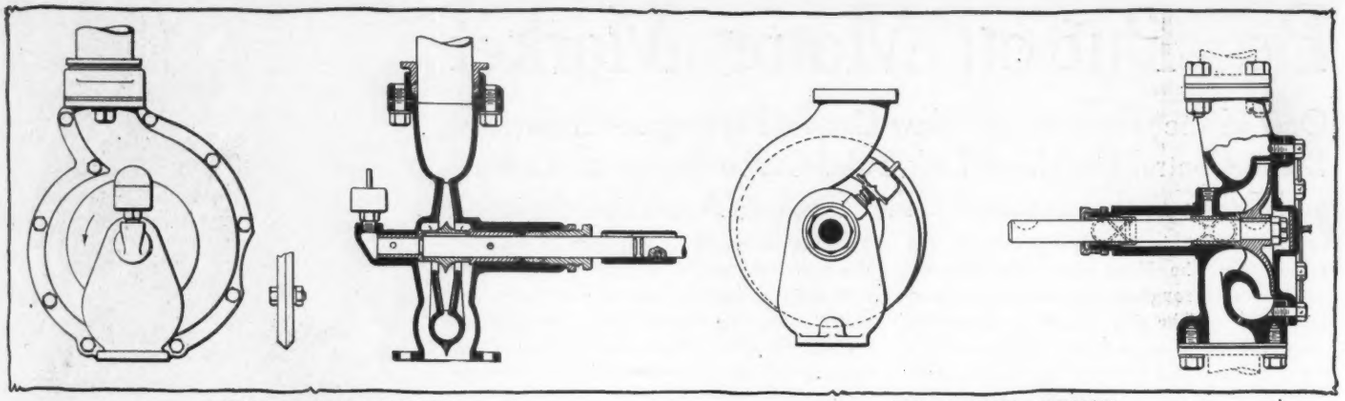


FIG. 1—PUMP DESIGN

FIG. 2—PUMP DESIGN

Testing Water Pumps Used in Motor Cars

By J. M. L. Howe

THE question often comes up as to the amount of power required to drive the different small units such as the magneto, the fan and the water pump, all of which detract from the motor power available to drive the car. The engineer should also be familiar with the characteristic performances of the units under different conditions, so that should any trouble occur, due to improper proportioning of these units to the work to be done, their performance may be checked up with others working under similar conditions.

The method outlined below has been used with satisfaction to determine the amount of power absorbed by different styles of centrifugal as well as gear pumps.

The pump to be tested, which was in this case a small centrifugal pump suitable for a 40-horsepower motor, and shown in Fig. 1, was directly connected to the shaft of a 5-horsepower direct-current, shunt-wound electric motor. The field windings were separately excited from a 110-volt line and controlled by a small hand rheostat. In the armature circuit was placed another rheostat of the water-barrel type and an ammeter. A voltmeter was connected across the poles of the motor to determine the voltage drop. The inlet and the outlet of the pump were so connected up as to draw water out of one barrel and pump it into another resting on scales. The barrels were arranged so that there was practically no static head to pump against, thus providing conditions similar to those in a car. One leg of a U-shaped mercury manometer was connected close to the pump on the outlet pipe and the other leg to the inlet, thus reading the total head, composed of the suction and the discharge head, produced by the pump.

Runs were made at different speeds and a number of readings taken during a run of the difference in length of the mercury in the manometer, voltage, amperage and the time required to pump 400 pounds of water into the barrel on the scales. The speed was determined by means of a hand tachometer. Directly after each run the pump was disconnected from the motor and with the field rheostat left exactly as in the run, the motor was brought up to the speed of the run by adjustment of the water rheostat and readings taken of the volts and amperes consumed by the motor with no load. This was done to determine the amount of electric power lost to drive the motor itself. The motor losses may be roughly divided into two general heads:

No. 1 Heating losses

No. 2 Stray power losses

The first loss is due to the current heating the armature windings, and its magnitude depends upon the amount of current flowing. The second is composed of a number of other losses, such as the power consumed in reversing many times a minute the magnetic polarity of the iron in the armature core and is known as the hysterisis loss, the power lost in mechanical friction of the commutator brushes and the bearings, also the air friction or windage, and the reaction between the current in the armature and that of the fields. For our purpose all the stray power losses may be considered constant for a given speed, whether the motor is loaded or not. The heating loss, however, varies with the amount of current flowing in the armature and so may be represented by:

Heating Loss = $W = I^2 R$ No. 1

When I = the current flowing in the armature in amperes.

R = the resistance of the armature winding in ohms.

W = the unit of electrical power, watts.

The resistance of the armature was determined by what is known as the drop-in-voltage method. A small current was sent through the armature when not rotating and readings of the voltage and amperage taken. By substituting in Ohms Law and transposing:

$$I_H = \frac{V_H}{R} \qquad \text{No. 2}$$

Where I_H = current flowing in amperes.

R = resistance of armature windings in ohms.

V_H = voltage of the current.

$$R = \frac{V_H}{I_H} \qquad \text{No. 3}$$

As our basis of electric power is the watt

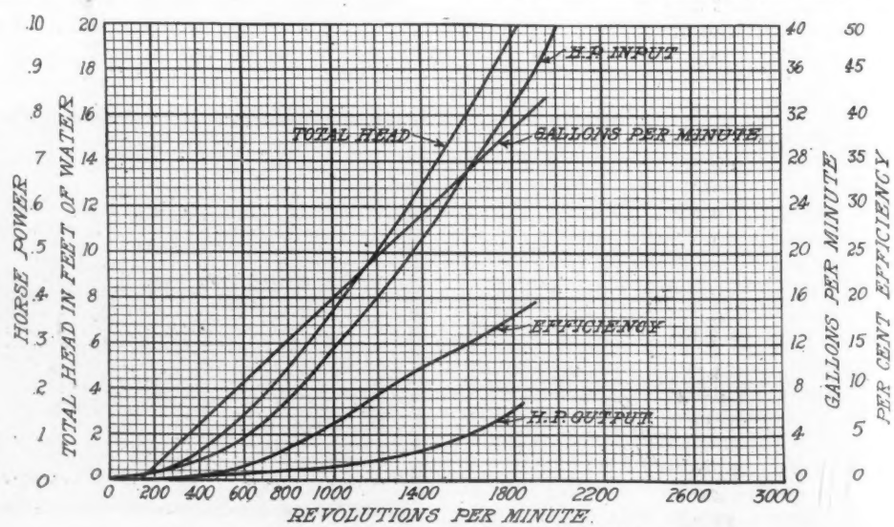


CHART 1—CHARACTERISTICS OF CENTRIFUGAL PUMP

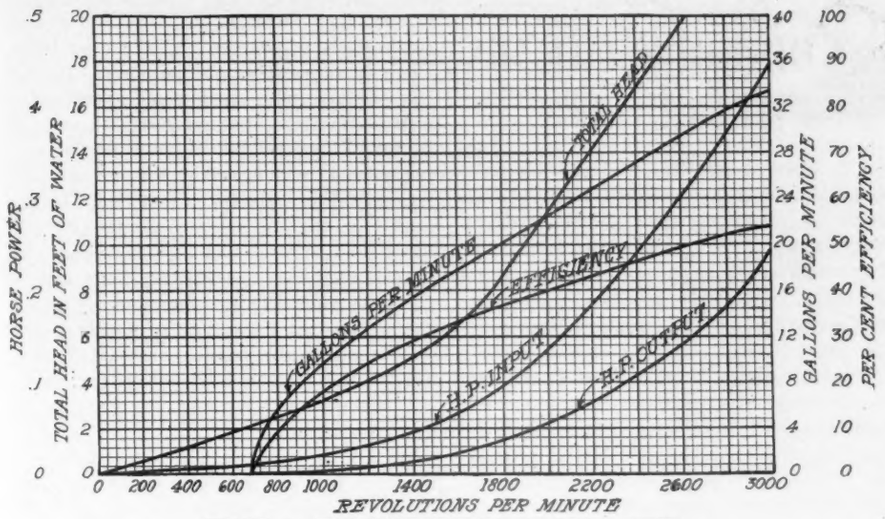


CHART 2—CHARACTERISTICS OF GEAR PUMP

and equal to the current strength in amperes, times the volts, by multiplying together the no load volts by the no load amperes and subtracting the no load heating losses, Ex. No. 1, we determine the stray power losses, which are assumed to be practically the same whether the motor is loaded or not. Now, if from the load run watts, we subtract both the load heating loss and the stray power losses, the remainder is the amount of power in watts used to drive the pump. As 746 watts equal 1 horsepower, we then have an easy means of determining the horsepower absorbed by the pump. To make the above clear, we may write:

Horsepower absorbed by the pump:

[Load volts × load amperes] — [No load volt × no load amperes — (no load heating loss) + (load heating loss)] ÷ 746. or

$$HP=\frac{\left[(V_P\times I_P)\right]-\left[(V_L\times I_L)-(I_P^2\times R)+I_P^2\times R)\right]}{746}$$

Where V_P=Volts with pump connected to motor
I_P=Amperes with pump connected to motor
V_L=Volts with pump disconnected to motor
I_L=Amperes with pump disconnected from motor
R=Resistance in Ohms of armature

Chart No. 1 illustrates graphically the characteristics of the centrifugal pump. It will be noticed that the horsepower input, horsepower output, gallons pumped per minute, total head and efficiency, have been plotted to revolutions per minute of the pump. The total head was computed by changing the number of inches of mercury head shown in the manometer to equivalent feet head of water, the gallons per minute computed from the time to pump 400 pounds of water from one barrel into the other, the horsepower output of the pump from the ability of the pump to raise a certain number of pounds of water per minute against the corresponding head in feet and finally the efficiency of the pump, the ratio of the horsepower output to the horsepower input. It will then be seen that the characteristics of the pump now for different speeds are known. If, however, we choke the outlet or inlet passages or in other ways cut down the amount of water handled, the characteristics would change as the friction head pumped against would be greater. The head pumped against is purely that caused by friction. It will be noted on examination of Chart No. 1 that no water is delivered until a speed of 680 revolutions is reached. This is due to partly overcoming the frictional head and a very small static head caused by the pump outlet being slightly above the surface of the supply water. This point is known as the point of impending delivery. Chart No. 2 shows a similar test run on a gear pump also for a 40-horsepower motor. Here impending delivery takes place at 150 revolutions per minute, as the gear pump is positive in its action after it handles enough water to make up for that which leaks by the clearances. It will also be noted that the gallons of water handled per minute by the gear pump is directly proportional to its revolutions per minute, but that the form of the curve of gallons pumped by the centrifugal is not strictly proportional, especially at speeds between 700 to 1,400. The efficiency of the centrifugal pump is also far better than that of the gear pump for corresponding speeds.

Basing the comparison of the two pumps when pumping 30 gallons per minute:

	Gals. per min.	Horse-power input	Eff. %	Head in feet	Speed
Centrifugal pump.	30	.32	50	20.2	2640
Gear pump.....	30	.79	17	18.8	1760

The above comparison should not be taken to show that the centrifugal pump is superior in every way to the gear. The centrifugal pump has to run at a higher speed of rotation to handle the same quantity of water, also it is not positive at low speeds, so that thermosyphon action may have to help it out.

Chart No. 3 shows a series of tests made on another centrifugal pump of the same type as used for Chart No. 1, with the standard impeller's direction of rotation reversed also with the special impeller, as shown in the sketch on this chart. The small circles represent test points determined with the impeller in its normal direction of rotation, the crosses the impeller reversed, and the V results obtained with a special impeller of smooth sheet brass, the blades of which extend from a 7/16 circle, the rotation being as shown.

Figs. 1 and 2 show two common types of small centrifugal pumps. The water in both cases is drawn through the lower passage to the center of the impeller wheel and is thrown out into the involute passage by centrifugal force. The latter, both from a manufacturing and efficiency standpoint, is superior. In Fig. 1 the incoming water has to divide into two streams, which later meet part way out on the impeller blades. This, while it does away with end thrust, causes considerably more fluid friction than the scheme employed in Fig. 2. The end thrust in this case is very small and is taken up by a washer.

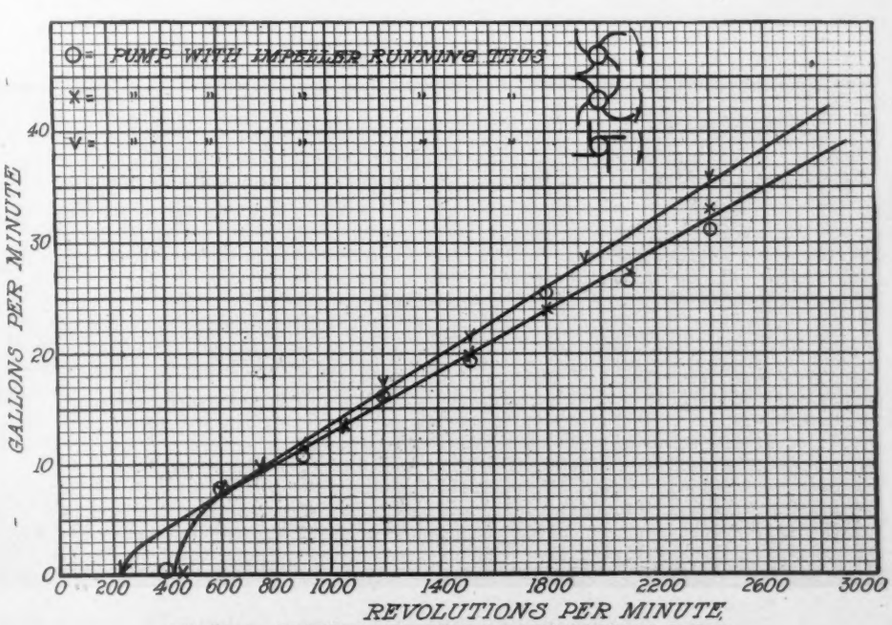


CHART 3—RESULTS OF TESTS OF CENTRIFUGAL PUMP

Manufacturers' Communications

FAN DYNAMOMETER TEST

MUNCIE, IND.—Editor Motor Age—For the purpose of trying out motor gearset and rear axles the Inter-State company has inaugurated the fan dynamometer test. The apparatus, which is used for this purpose, consists principally of a horizontal shaft, mounted in substantial bearings and carrying four fan blades whose surfaces are held at right angles to their path of rotation. These blades are mounted upon radial supporting arms in a manner which permits of their adjustment to vary the diameter of their circle of travel. This allows the load to be increased or diminished, as it is evident that as the circle described by the fan blades is made larger more power will be required to drive them. It follows that the faster they are driven the greater will be the power absorbed and thus the load upon the motor is varied exactly as under actual running conditions.

The entire apparatus is driven by means of sprockets on the shaft which are in turn driven by chains from sprockets mounted just as are the wheels upon the rear axle of the car. By this arrangement, every part of the driving mechanism is subjected to such strains as are received under actual road conditions and any weakness in then disclosed.

A speedometer is fitted to the shaft of the dynamometer and the speed of the car and the distance traveled, were it running upon the road, recorded. The running time and the elapsed time also is noted. The actual running time varies from between 6 to 8 hours at speeds ranging from 20 to 60 miles an hour, the length of time depending largely upon whether or not defects are discovered in the different parts, and is equivalent to a run of 200 to 250 miles on the road. This test is really more severe, for it imposes a constant load upon the motor or has the effect that running up a continual grade would have. The momentum of the fans is not sufficient to carry the motor through its revolutions as the car does in descending a grade, and the rests of actual road use are entirely absent.

The operator in attendance works the car through the different gear changes and speeds. Any noise which may be discovered in the gearset while running on intermediate or low speeds is remedied. The differential gears may be inspected and trouble arising from faulty construction or improper adjustment be eliminated. Any defect or knock in the motor may be located without a possibility of doubt as to its exact nature, for the operator can give his undivided attention to these details. The action of the clutch is noted and all adjustments made which will facilitate its perfect operation. The brake-operating levers and rods also may be adjusted while the chassis is being tested.—Inter-State Automobile Co.

AS SPRING MAKER SEES IT

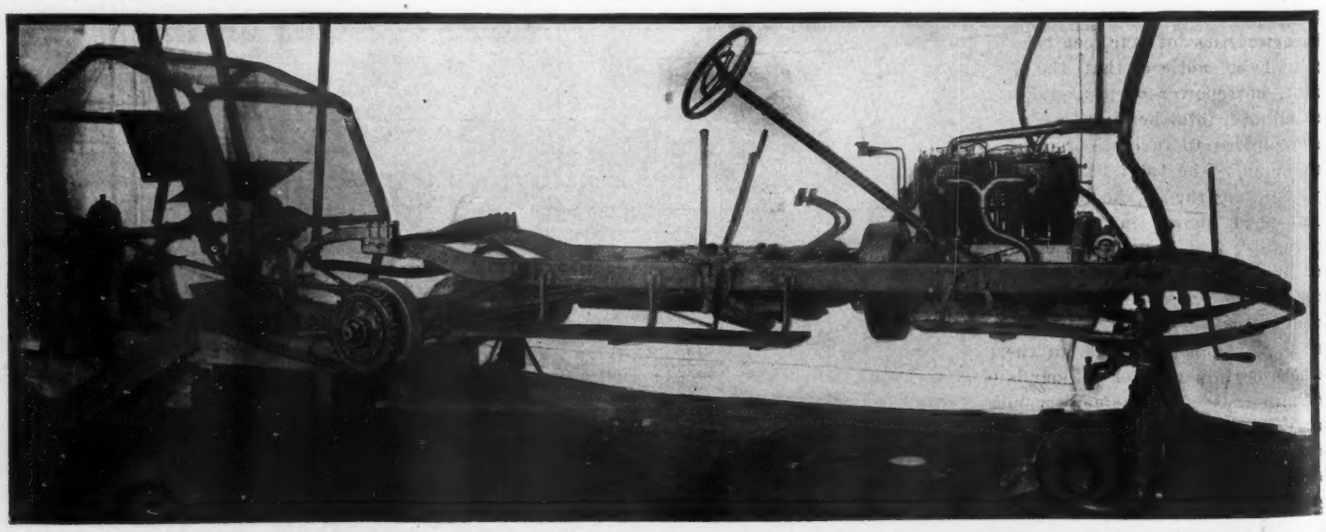
Chicago.—Editor Motor Age—I have read with considerable interest an article in Motor Age, issue of February 16, on shock absorbers, written by E. V. Hartford, which is, of course, a good boost for his own wares. While not denying in the least the benefit of shock absorbers on certain spring suspensions, I must differ from Mr. Hartford when he says a spring cannot be made to ride properly without his device. It has just been brought to public notice that springs can be constructed in such a manner that one member of a certain modulus of vibration acting upon another member of a different modulus will break up the action in such a way that there is no throw noticeable in the body of the car. At the same time, there is no sacrifice of resiliency. If this can be done, why use a shock absorber?

Mr. Hartford recommends 10 to 12 inches of vertical travel for a proper riding spring, which would for a certainty make another sale for his device. I contend that the less vertical travel you can have in a spring, and still maintain the proper resiliency, the better your car is going to ride. This is particularly so in the country, and the form of spring I just mentioned might be so constructed that one of the members would be extremely soft and resilient without any liability to excessive recoil.

Of all the cars in existence today, I think it is safe to say that 80 per cent of the mileage is within the city or town limits, where the streets are comparatively good and where the speed is within reason. None of our streets is in a condition to throw the car on the rebound, even were one to travel at high enough speed.

Mr. Hartford contends that the shock absorber prevents the spring from breaking. Well, how about it? Now, if the friction of this shock absorber is enough to prevent the car from going down with an excess load, imagine the amount of resiliency that you are going to take away when there are two people in the rear and going at the rate the city allows over ordinary streets. You must sacrifice at least 50 per cent of your resiliency, and where in the city do you strike a bump going beyond the speed limit, which is an exceptional case? There are at least 500 smaller bumps where the shock absorber would be useless. On the other hand, if the streets were so rough that it would allow the car to throw, there might be some use in the shock absorbers.

Any careful observer can see readily that the condition of our streets is not such that it would throw the occupants out of the seat going at the city speed. Therefore, it is safe to say that you are



DEVICE DESIGNED BY INTER-STATE AUTOMOBILE CO. FOR FAN DYNAMOMETER TEST

sacrificing a great deal of your resiliency under normal conditions to take care of the once-in-a-long-while shock that you might strike with careless driving. Let two cars stand side by side, one of which has friction shock absorbers on which work both ways. Place your weight on the running board of one car and then do the same with the other, and you will readily see what you are sacrificing with the 500 smaller bumps under ordinary circumstances. Ninety per cent of the touring cars of today are made for family use and not for insane high-speed work. Let the manufacturer cater to the 90 per cent and let the 10 per cent of high-speed fanatics take the bumps with the shock absorbers on.

To the manufacturer I would say that a spring can be manufactured that will take care of its own rebound. This can be accomplished in two ways: By placing two leaves of different lengths on the top of the semi-elliptic spring. These leaves are made straight and tempered the same as the other leaves and bolted to the top of the spring. This bends the plates to fit the spring. The tendency of this always is downwards, and the friction of these plates tends to stop the rebound. Another way it can be accomplished is to let the front end of the upper half of the spring come forward past the spring seat on the body, resting on the lower spring about half way between the center of the spring and the front end. This tends to check the rebound in a wonderful way. Springs should be manufactured with this point in view, to limit the action of spring so that it will neither go down too far nor come back too far. The spring should be as straight as possible, and where scrolls are used they should be very small, as these tend to throw the car, to the discomfort of the passengers.

Then tendency of spring construction today, especially for commercial cars, is to use some kind of a coil on the rear end of the spring. This tendency was very marked at the shows this year. Combinations of two or more springs in place of a single spring, with one spring more resilient than the other, will break up the action. For example: An elliptic whose bottom and top members are the same length tend to toss the car, but make one of these members shorter than the other and one more resilient than the other and the vibration will be broken up to a remarkable degree.

Lastly, I would say that if the use of shock absorbers has been such a blessing, why do we not see them at least once in a while on the light commercial cars, where solid tires are used and where the speed is nearly as great as that of the touring cars?

If the manufacturers would put the expense in their springs that they do in shock absorbers and use either one of the devices I have mentioned above, it would be better for the motor car in general.—S. Furmidge.

The Motorists' Bookman

The Art of Roadmaking

OF paramount interest today, not only to the motorist but to the public in general, is the subject of good roads and how to make them, for "roads may be said to be the backbone of the national life of a country and the most important element in the progress of civilization from the very earliest times." In a resume of the subject Harwood Frost, in his book entitled, "The Art of Roadmaking," says: "Roads should not be considered merely as local facilities for traffic; it is possible to develop them into great trunk lines with many branches, just as a railroad may have many branches connecting the main line with fertile agricultural districts and great commercial centers. One of the greatest values of the road is in reaching where the railroad cannot. There is no other means of traveling or hauling which possesses the advantages of through communication from farm and garden to market, from house to office, from dairy to factory or shop, or for pleasure travel, that are offered by a complete and consistent system of roads."

In this book of 544 pages the author aims to discuss the many problems confronting the engineer in road building; the properties of road-making materials; and the care, control and prevention of dust. A bibliography and descriptive list of reliable books on the subject from 1583 is an interesting feature of the book, as well as the digest of state aid laws showing what many of the states are doing along this line. The Engineering News Publishing Co.

The Great White North

Helen S. Wright has compiled an exhaustive account of Polar history from the earliest times, beginning with the voyage of the Greek Pytheas when he reached Thule, which is identical with Iceland, down to the wanderings of Dr. Cook. It is not only an excellent reference book, containing as it does a vast amount of valuable information, but a record of toil, of suffering, and of human sacrifice by men lured to the frozen north. It is a 475-page volume, illustrated with Arctic scenes and portraits of all the leading explorers. The frontispiece is a portrait of Commander Peary. The Macmillan Co., publisher. Price, $2.50.

Book for Motorists

"The Automobile: Its Selection, Care, and Use," by Robert Sloss, is a 194-paged volume which tells how to select a car, what is necessary to its proper care, how to secure the greatest amount of comfort and safety, the care of tires, how to locate motor troubles, the housing of a car, and instructions for touring and camping trips. In the appendix is given a valuable trouble chart. It is published by the Outing Publishing Co., New York, and should interest many motorists.

Who's Who For 1911

"Who's Who for 1911" follows its previous style of containing alphabetically biographies of representative citizens, irrespective of the vocation he follows. Twenty-three hundred pages are given over to these biographies, which are condensed as much as possible. These biographies are of people in many countries. The book is of particular value as a reference volume. The Macmillan Co., New York. Price, $2.50 net.

Siena and Southern Tuscany

Students and travelers who are fond of delving into the history of the country through which they are touring, will find Edward Hutton's "Siena and Southern Tuscany" helpful. In its 360 pages the author has amassed valuable historical information on Siena and the surrounding section of Italy. There are sixteen illustrations in color of typical scenes and twelve in monotone. The Macmillan Co., New York. Price, $2 net.

Ribbon Roads

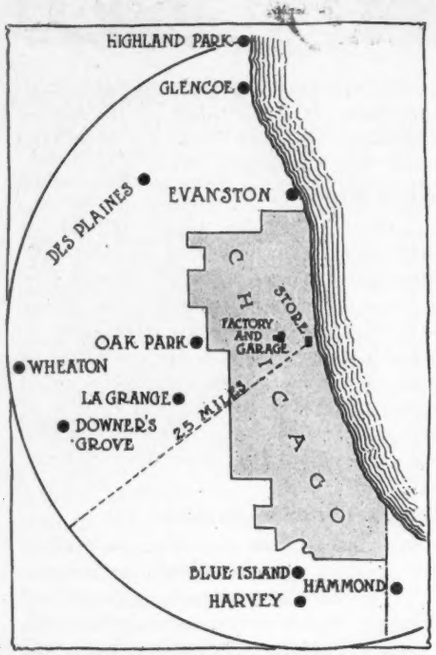
Now that the touring season is about to open the motorist's attention naturally is drawn to the subject of tours and kindred topics. One of the latest tour books is "Ribbon Roads," a motor tour abroad, by A. T. and B. R. Wood. The British Isles—England in the late spring, then Scotland, and Ireland in the early summer, was the first part of the program; then touring on the continent, through Holland and Germany in the full bloom of summer; Italy in the month of August, and finally Paris, the end of the tour. A long, long trip, through countries filled with historic interest, to cram into 222 pages, so that the authors scarcely more than touch on the points of particular interest. There are eighty illustrations of typical foreign scenes, and two maps showing the complete itinerary. Not only motorists in this country, but Europe as well, who contemplate touring on the continent, will find this book helpful when making up the itinerary of their trip. G. P. Putnam's Sons, New York.

Who's Who in America

"Who's Who in America" for 1910 and 1911 is a biographical volume containing over 2,300 pages of short biographical sketches arranged alphabetically. It contains 17,546 names and sketches. In addition to these sketches are references to 6,411 sketches in previous editions, giving an available reference to 23,957 personal biographies. A. N. Marquis & Co., Chicago. Price, $5.

Motor Truck Is Peculiarly Adapted

Lyon & Healy of Chicago, Using Three Commercial Wagons, and Twelve Men, Delivered 8000 Instruments Last Year, Work That Would Have Required Eight Wagons and Thirty Men



ZONE OF OPERATIONS OF PIANO-MOVING TRUCKS IN CHICAGO

THE retail delivery of pianos in a large city offers a field of usefulness for commercial motor cars that is being developed in Chicago. The fact that only a few instruments can be carried at a time makes any definite routing of the trucks almost an impossibility and the requirements of the service are very different from those of most retail systems, such as the larger department stores, where a great number of small packages are handled every day. When to this is added the necessity of delivering smaller instruments, and even sheet music, the difficulties are increased. The piano buying public demands suburban deliveries and any system that is installed must provide for carrying the instruments anywhere within a radius of from 12 to 25 miles from the store.

Lyon & Healy, of Chicago, have developed a system of delivery of musical instruments by motor trucks which serves to show a very satisfactory solution of the problems involved. This firm handles not only pianos but smaller musical instruments of all kinds, as well as sheet music. Many of the orders are sent on approval, which means that not only must they be delivered but many cases require a second trip for returns or pick-ups, as they are called. This is especially true in regard to sheet music, where customers select a number of pieces to try, with the privilege of returning as many as desired.

In handling this business five trucks are used. These include two Packard cars of 3-ton capacity, which are capable of carrying six or seven pianos at a load; one Knox truck of 1½-ton capacity, which will carry four pianos; a 1,500-pound Locomobile capable of carrying one piano; and a 1-ton Kisselkar which will handle two instruments has just been added.

The Daily Schedule

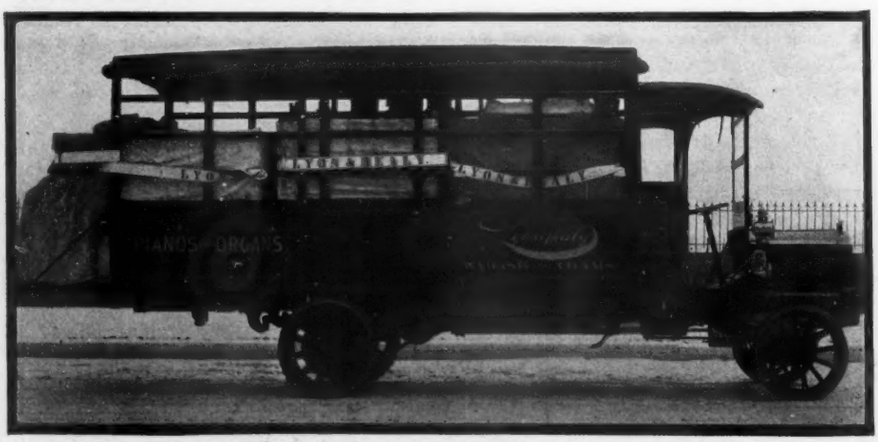
The garage is located at the factory, 2 miles from the store, and the trucks are loaded there in the morning with instruments to be taken to the store. By the time they arrive with their loads the store is open and the instruments are transferred onto a loading platform and the trucks reloaded for outside deliveries. In the evening, when the trucks return with their load of pick-ups to the store, they are reloaded with returns for the factory. Both at the factory and at the store are special loading platforms the height of the truck body, which will accommodate two cars at a time and allow of easy and rapid loading and unloading. With each truck is sent four men, including the driver, who assists in moving the pianos when necessary. No definite system of routing is attempted, although all the deliveries for any of the three sides of the city are separated and taken by any one of the trucks. Deliveries are made regularly to all points within a radius of about 25 miles from the store, taking in suburbs as far as Wheaton on the west, Highland Park on the north, Harvey on the south and Hammond, Ind., on the southeast.

A Sample Day's Work

An instance of the usual day's work of one of the trucks will show how the deliveries and pick-ups are handled. Recently one of the 3-ton trucks was loaded at the factory with seven pianos and the crew and took the instruments to the store, arriving there about 8 o'clock. Here it was reloaded with seven pianos and sent to South Chicago, a distance of about 12 miles, making deliveries at various points along the route. On the return trip several pianos and small instruments, as well as numerous orders of sheet music, were picked up and returned to the store before noon. At 1 o'clock the car went back as far as Eighty-third street, 10 miles to the south, with six more instruments, picking up a load on the way back and reaching the store by 6 o'clock in the evening, where it was reloaded with instruments for the factory. The garage is located at the factory and this arrangement saves extra trips between the factory and the store. An idea of the saving in time effected by the use of this one truck on this particular trip may be obtained from the fact that the same trip south would require all day for two horse-wagons of the largest size, with eight men, and the second trip could not have been made the same day. Further, it would have been necessary to rest the teams the next day.

Three Teams Displaced

The experience of this company has shown that on account of their greater carrying-capacity and speed each of the two 3-ton trucks accomplish almost the same work in a day as is done by three of the largest horse-drawn piano wagons. Further, each wagon with its crew of four men costs $13.55 and this figure also exactly represents the average running cost of the motor truck with its crew, exclusive of the charges for repairs. These charges amount to about $2.86 per day and bring the total daily cost of operation up to $15.41, without taking into consideration the depreciation or interest on the investment in either case. The total daily cost of the three horse-wagons required to do the work of the one motor truck would be $40.65, a saving of over $25 a day for each



ONE OF LYON & HEALY'S TRUCKS, A 3-TON PACKARD, CARRYING SEVEN PIANOS TO CHICAGO CUSTOMERS

To Needs of the Piano Manufacturers

Service Started Six Years Ago and Has Been so Successful That Two More Trucks Have Been Added to the Fleet—How the System Is Operated—The Economy of Motor Delivery

of the large trucks. It would seem at first glance that the cost of delivery could be lessened by discarding the smaller trucks and replacing them with the larger ones, as it is plain that the saving is much less with the cars of smaller capacity. It must be remembered, however, that the trucks show this efficiency only when they are worked every day to their maximum capacity. It is often the case that all the deliveries for any one section of the city can be carried on one of the lighter trucks and it would not be at all economical to send out a large truck with only half a load. That this is realized by those in charge of this department is shown by the recent acquisition of a 1-ton truck. Tire expense is, of course, the major item in the repair account, amounting to nearly half the total daily repair bill.

Deliver 8,000 Pianos a Year

During the past year 8,000 pianos have been delivered with three trucks and twelve men. In addition to this, all the deliveries of smaller instruments and sheet music have been handled at the same time. To do this work without the use of motor trucks would have required six or eight wagons, with perhaps twelve horses and about thirty men, as well as a force of boys for delivering the smaller orders. The greater speed that the motor truck can make gives them not only a wider radius of action, but also very materially cuts down the labor expense for the crew because the men are at work transferring the load a greater proportion of the time and are not spending so much time riding.

The first truck was installed over 6 years ago and is still in service, the other cars being added to the service as the deliveries increased. No attempt was made to transfer the drivers of the horse-drawn vehicles to motor trucks, but professional truck drivers were hired in nearly every case. This was made necessary by the rule that every driver should be his own mechanic and make all repairs that became necessary, whether on the road or in the garage. The drivers are under the supervision of a garage-man, but are held responsible for the care and operation of their own cars.

Driver Does Own Repairing

An attempt was made at one time to have a regular repairman at the garage to take care of all repairs on the car, but it was found that with the knowledge that a man was on hand at the barn to fix all break-downs the drivers were less apt to make the small adjustments that often become necessary on the road and which when neglected often cause the car to be laid up for several days. Under the present system, while the drivers must be more competent men and therefore more highly paid than otherwise, the salary of the expert mechanic is saved and the trucks are in service a greater proportion of the time. Nearly all the repairs that need to be made can be attended to at the garage, and if not the machine shop of the factory is at its disposal. Emergency repairs that become necessary on the road can in nearly every case be attended to by the driver, but when a truck is completely broken down a hurry-up call to the garage sends the nearest truck to its rescue and it is then towed in. Each of the trucks is laid up once a year for about 2 weeks for repainting, at which time it is given a thorough overhauling in addition to the regular daily inspection.

No attempt at high speed is made, although the lightest car can maintain a speed of about 30 miles an hour when necessary. The two heaviest trucks are so adjusted that they cannot be run faster than 12 or 14 miles an hour, while the medium-sized ones have a maximum speed of 25 miles an hour. The lightest car is not regularly used for piano moving, but is employed in delivering the smaller musical instruments and is held in readiness at the garage for emergencies.

The garage itself is especially fitted for this class of work. It was originally a part of the barns in use when deliveries were made by horses, but has been remodeled to meet the conditions of truck delivery. The main storage room is 100 by 84 feet in size and out of this space is taken for a small office, locker room and tool room. It has a cement floor with the ceiling supported by wooden columns which are spaced far enough apart to not interfere seriously with the movement of the cars. A cement repair pit near the tool room permits of easy work under the car, while the gasoline and oil reservoirs are in a separate room within quick access. The garage is heated by steam supplied by the heating system of the factory.

FIGURE THE COST

Brunn & Co., liquor dealers of Portland, Ore., owners of a 1-ton White truck, made a record of its performances during a recent run of 1,304 miles. Eighty gallons of gasoline were consumed, an average of 16.3 miles per gallon. This was during a term of 2 months 6 days. The total running expense exclusive of gasoline and oil was $77.90. The table follows:

Gasoline used, gallons	80
Distance covered, miles	1,304
Oil used, quarts	9
Average miles per gallon of gasoline	16.3
Average miles per gallon oil	579.55
Speedometer	$30.00
Chamois and funnel	2.25
License	2.50
License	3.00
Storage	15.00
Insurance, 12.6 cents per day	8.45
Extra inner tube	16.70

TRUCK AS A MONEY SAVER

One of the sights on lower Broadway, New York, and surounding neighborhood recently was a 7-ton Mack dump truck, working for snow contractors, Joseph Murphy & Son, furnished with snow plow for cleaning the streets of snow. This truck worked 18 hours, in two shifts of 9 hours each, doing the work of 200 men, which at $2 per day of 9 hours would amount to $800. At this rate the truck paid for itself in 8 days. While horses were falling in every direction on the ice and snow, the Mack dump truck was carrying full loads and doing the work of eight teams.

VELIE SERVICE CAR, USE OF WHICH IS TENDERED CITY OF BOSTON TO CARRY OFFICIAL VISITORS

Uncle Sam Compiles Regulations now in Force in Foreign Countries Relative to Custom Conditions Regarding Motor Cars. What is Necessary to do in Other Parts of the World.

AUSTRALIA

A CUSTOMS order of September, 3, 1910, provides that the duty on motor cars in Australia shall be levied on the home-consumption value in the exporting country of each part, even when such parts have been assembled and imported into the commonwealth as complete cars. The accompanying invoices must set out, in addition to the price of the complete car, the country of origin, and the prices ordinarily charged for the chassis, body, footboards, mudguards, tires, and lamps when sold separately for home consumption in the country whence exported. A declaration on the face of the invoice by the manufacturer, exporter, or authorized agent in the following form is required:

I, ———, manufacturer or supplier of the goods described in this invoice, do hereby declare that the prices shown thereon for the complete car and for the several parts are not less than the prices charged to purchasers of similar cars and parts for home consumption in this country.

The import duty on motor cars and parts in Australia is as follows: Bodies for motor cars and wagons and parts thereof not specified, 30 per cent ad valorem when imported from the United Kingdom and 35 per cent ad valorem when imported from other countries; chassis for motor cars and wagons, not including tires, free when imported from the United Kingdom and 5 per cent ad valorem when imported from other countries; lamps and lanterns, 15 per cent from the United Kingdom and 25 per cent from other countries; rubber tires, 20 per cent from the United Kingdom and 25 per cent from other countries; footboards and mudguards are subject to the same duty as the chassis, while motor car parts and supplies, other than parts of chassis, are dutiable as the body.

CANADA

The customs regulations governing the temporary admission of motor cars into Canada, as contained in memorandum No. 1571B, in force April 1, 1910, and reprinted below, require generally a bond for double the estimated duties and a deposit of $25. For motor cars remaining in Canada not more than 3 days, a permit is issued, apparently without deposit or bond.

1. Motor cars manufactured abroad and not duty paid, when imported into Canada by the owners personally who are nonresidents of Canada or temporary visitors therein, may be admitted under bond or upon cash deposit, for a period of 3 months, for the actual use of the owners for touring purposes only, provided the owner is in nowise connected with any motor car business and that the machine is not to be used for any commercial or business pursuits whatever while in Canada, and subject to the following regulations and conditions:

(a) The motor car shall be reported on form approved (E. 29½) in duplicate, at the customhouse at the port of importation, where a careful examination and appraisement shall be made.

(b) An invoice showing the selling price of the motor car shall be produced when practicable, as an aid to the collector in determining the value.

(c) Upon receiving a deposit of $25 and a bond executed in Canada in approved form for double the estimated duties, conditional for the due exportation of the motor car covered thereby within 3 months from date of bond, the collector may grant a permit accordingly, to be indorsed on the duplicate report, for the use of the motor car in Canada for touring purposes.

(d) The bond shall be signed by the importer and by two residents; or by the importer and by a resident of Canada who has deposited with the collector of the port of entry the general guaranty of an incorporated guaranty company authorized to do business in Canada, and which guaranty is then available as a security in the case; provided that the special bond of an incorporated guaranty company authorized to do business in Canada may also be accepted, in approved form, instead of the bond first herein mentioned, and that the cash deposit of $25 may be dispensed with in any case covered by a special or general guaranty bond.

(e) The bond shall be filed by the collector with the tourist's report attached, and the duplicate report shall be handed to the tourist with permit and receipt for deposit indorsed thereon.

(f) The deposit shall be subject to refund by the collector upon return of permit with proof of the exportation of the motor car within 3 months from date of bond. In default of the exportation of the motor car with proof of such exportation to the satisfaction of the collector within 3 months from the date of importation, the deposit is to be entered as customs duty and the provisions of the bond enforced.

(g) The term "motor car" herein is to be held as including the outfit accompanying the motor car.

3. Motor cars manufactured abroad and not duty paid may not be reimported for touring purposes within 6 months from the time of their exportation after previous entry in bond for touring purposes. This limitation, however, shall not apply to motor cars provided for in the section next following.

4. The regulations in memorandum 940B of July 31, 1897, concerning teams and carriages crossing the frontier, provide that where the persons in charge of such teams and carriages are well known to the customs officer he may allow the outfit to cross the frontier and return within 1 week, subject only to the usual report, search and examination. This provision may be extended to tourists' motor cars when the customs officer is satisfied that the motor cars will be used only within the limits of the port of importation and vicinity in conformity with customs laws and regulations.

FRANCE

By law of April 8, 1910, supplemented by law of July 25, 1910, and customs circular of August 12, 1910, a special tax is imposed on motor cars belonging to persons residing temporarily in France, which are not subject to the ordinary direct taxes on vehicles. The tax is made up of two items, one a fixed rate of 50 francs for one or two-passenger cars and 90 francs for cars of a greater seating capacity, and the other varying according to horsepower as follows: For the first 12 horsepower at the rate of 5 francs for each horsepower or fraction thereof; for the next 12 horsepower, 7 francs each; for each horsepower from 25 to 36 horsepower, 9 francs; for each horsepower from 37 to 60 horsepower, 12 francs, and for each horsepower over 60 horsepower 15 francs. These rates cover 1 year—360 days; for shorter periods, one-twelfth of these rates is imposed for each month or fraction thereof. Machines retained in the country for not more than 4 months consecutively are exempt from the tax. The tax is collected on the departure of the vehicle from the country, when the bond or other guaranty for the payment of the import duties in the event of failure of re-exportation is canceled.

GERMANY

Since the new international agreement entered into at Paris on October 11, 1909, went into effect, on May 1, 1910, foreign motor vehicles temporarily operated in Germany are subjected to two different sets of regulations, depending upon whether or not they are vehicles of one of the contracting parties to the agreement mentioned.

If provided with an international passport, it is only necessary to present it to the customs official at the border, who affixes his stamp, after having convinced himself that the passport is properly filled out and still in force and that the regulations for the display and lighting of the number and the letter designating its nationality have been complied with. This passport is also to be presented for vise to a customs officer upon leaving Germany. As the United States was not a party to the international agreement, Americans are excluded from the benefits of the international passport.

Foreign motor vehicles without an international passport may be admitted into Germany if the driver can present to the customs official at the border or to the ap-

Red Tape as it is found in Australia, Canada France, Germany, Spain, Jamaica and the United Kingdom as Published in the Daily Consular and Trade Reports.

propriate local officials in the interior a certificate from the proper officials in the foreign country or from parties officially authorized to issue such certificates to the effect that the vehicle in question complies with the local police requirements of his country. These certificates must state the name and residence of the owner, the name of the firm that manufactured the chassis, the factory number, the kind of motive power and the horsepower of the machine or of the motor, the weight of the vehicle and its loading capacity in kilos (1 kilo=2.2046 pounds) or in number of persons, including the driver. These certificates must also be countersigned by the German consul having authority in the district where they were issued. Instead of the regular German driver's license, the driver of the foreign motor car may produce appropriate local testimonials or certificates, also countersigned by the German consul. A foreign motor vehicle in Germany not provided with an international passport is furnished with a special elliptical number card, for which a fee of 2 marks (48 cents) is collected in the case of motor cycles and motor cars for a stay in Germany of only 1 day; in other cases it is 5 marks ($1.19). If the requisite certificates and testimonials cannot be produced, the ordinary regulations for German vehicles and drivers.

The tax on foreign motor vehicles in Germany is as follows: Motor cycles for a stay of not over 30 days in a year, 71 cents. Motor cars for the stay mentioned within a year: One day, 71 cents; 2 to 5 days, $1.90; 6 to 15 days, $3.57; 16 to 30 days, $5.95; 31 to 60 days, $9.52; 61 to 90 days, $11.90. The days need not be consecutive. Those days during which the vehicle is in a German garage or repair shop for the purpose of repair or improvement, as well as the days during which the motor car may have been taken across the German border, are deducted, providing the card of admission or tax card was stamped by the customs official at the border both going out and returning into Germany.

SPAIN

By royal decree of July 20, 1910, promulgated August 8, the regulations affecting tourists' motor cars have been recast. Hereafter two kinds of permits may be issued, the one authorizing repeated crossings of the Spanish frontier within 1 year and the other limited to a single entry and a stay of not more than 40 days in Spain. The permit for the longer period is granted only to persons having a permanent residence out of Spain, who prove seaports. A personal bond or deposit is required sufficient to cover the import dutheir ownership of the motor car by license issued in the country of their residence; the motor cars may enter Spain by the land frontier from France or Gibraltar or, if arriving from countries having only water communication with Spain, at the ties and all other charges that would fall due if re-exportation should not take place within the time limit. Membership in a club affiliated to the Royal Automobile Club of Spain lessens the customs formalities. A copy of the decree in Spanish, together with an English translation, is on file in the bureau of manufactures in federal headquarters in Washington.

JAMAICA

Visitors to the island may bring in their motor cars, gasoline launches, carriages, horses, bicycles, guns, fishing tackle, and such like articles for personal use without payment of import duty. Thirty per cent of the amount of duty payable at time of importation must, however, be deposited by way of guaranty with the collector, who will return it on the articles being taken away from the island within 2 months. Motor cars, carriages, horses and bicycles coming under this privilege may be used on the public roads free of taxes for 6 weeks.

Should a motor car or other article admitted free under this rule be not exported within 2 months after importation, the collector shall withhold a sum equal to 5 per cent of the duty for each month or part of month during which such article is kept in the island beyond the specified period of 2 months up to the limit of the 30 per cent deposited. If sold or not exported within 8 months from date of importation the car or other article shall be deemed to have been finally imported, and must be entered and duty paid according to law on value at time of importation, allowance being made for any interim payments already made under this rule. Articles not so entered and duty paid, on being sold or kept in the island beyond 8 months are liable to be seized as "uncustomed" goods under the provisions of section 156 of law 18 of 1877, or duty may be recovered under section 32 of law 24 of 1885.

UNITED KINGDOM

A treasury order, published in August, 1910, exempts from excise license foreign motor cars brought into the United Kingdom for not exceeding 4 months by a person usually residing abroad. This will perhaps be of interest to many Americans who land cars at Liverpool for touring purposes, and especially to those who may have paid license fees recently. While it is a fact that payment of the excise duty has often been omitted, yet it was always with risk, and as high a license as £21 ($102.20) was recently paid in Liverpool by an American tourist. As appears in the text, the order is retroactive in effect from May 1, 1910.

1. It shall not be necessary for an excise license be taken out or for any duty to be paid under section 86 of the finance (1909-10) act, 1910, in respect of any motor car brought into the United Kingdom, by a person usually resident abroad and making only a temporary stay in the United Kingdom, if the motor car is not kept in the United Kingdom for a period exceeding 4 months from the date of registration as hereinafter defined.

2. This exemption shall not apply unless, as evidence of registration, either the international traveling pass issued in respect of such motor car, duly stamped and dated by the customs and excise officer, or, if no such pass has been issued, the copy of the entries relating to the motor car in the register of the registering authority furnished to the owner under article 3 of one of the motor-car (registration and licensing) orders, 1903, applicable to England, Scotland and Ireland, respectively, is produced on demand—(a) in England (including Wales) or in Ireland, to any duly authorised officer of a county council or county borough council; or (b) in Scotland, to any officer of customs and excise.

3. For the purpose of these regulations the date of registration shall mean (a) in any case where an international traveling pass is produced, the date of registration inserted in the pass by the officer of customs and excise at the port of landing, and (b) in any other case, the date upon which the motor car was registered by the council of a county or county borough as shown upon the copy of the entries in the register; or if the car was brought into the United Kingdom in a year subsequent to the year in which the car was so registered, the date on which the car was brought into the United Kingdom in that year, as attested by indorsement upon the copies of the entries by the chief officer of customs and excise at the port of landing, and the chief officer of customs and excise shall, upon application at the time of the landing of the car, indorse and sign the said copy. These regulations shall have effect as from May 1, 1910.

OLDFIELD Sells Cars, Is Report—It is reported from San Antonio, Tex., that Barney Oldfield has sold his racing cars to E. A. Moross.

Long Run in Electric—Claim is made by the Chicago Babcock branch that H. Kuhn drove a Babcock electric touring car 175 miles on a single charge of the batteries. The run was made in Chicago February 4. The car was equipped with sixty A-6 Edison cells. Kuhn claims he averaged 15 miles per hour his drive.

Michigan Must Economize—Because of the necessity for economy it is more than likely that the special appropriation of $1,700,000 asked by Senator John Leidlin, of Saginaw, for the reorganization of the Michigan highway department and the building of new roads will be turned down by the present legislature.

Recent A. A. A. Sanctions—Chairman Butler's A. A. A. list shows the following sanctions issued: March 12, match race at Los Angeles motordrome; March 6-10, reliability run of Houston Motor Club; March 27-30, beach races at Jacksonville, Fla.; April 8-9, 24-hour race on Los Angeles speedway; April 29, Quaker City Motor Club roadability test.

New Montana Club—The Flathead Motor Club has been organized in Kalispell, Montana, with a membership of twenty-four, adopting with slight modifications the constitution and bylaws of the Chicago Motor Club. The officers chosen were: President, E. E. Givens; vice-president, M. W. Botorff; secretary and treasurer, F. D. Stoop. Two directors were chosen also, Joseph Edge and Robert Pauline.

Missouri Organizes—Papers have been filed for the incorporation of the Missouri Automobile Association, an organization to promote, conduct and hold motor contests. The plans, which have been in course of formulation for several months, include state wide organization and affiliation with the A. A. A. The charter members are F. W. Payne, O. H. Cook, Joseph A. Schletch, H. W. Harrington, Charles P. Luhn, F. G. Smith and W. Ashley Gray. The membership is open to owners as well as to men in the trade.

Bull Dog Will Run on Rails—Arrangements with the Canadian Pacific Railway for a track ride on the C. P. R. lines through the Rockies next June have been made for the Abbott-Detroit Bull Dog. From Vancouver to Calgary it is proposed to give the car the rank of a special train on the C. P. R. the wheels being fitted with flanges so that they may run on the tracks and the Bull Dog being accompanied by a train dispatcher and a conductor. At Calgary the Abbott will take the road again and it is expected that Montreal will be reached 1 month later. From Montreal the trip will extend to Panama, Costa Rica, Guatemala, British Honduras and the Central American republics.

Many Miles of Macadam—A contract for constructing 69 miles of macadam roads in the Denison, Tex., good roads district at a cost of $250,000 has been let. It will require at least 12 months to complete the work.

Michigan Oiling Roads—The road commissioners of western Michigan are becoming converted to the use of oil for roads. The commissioners of Muskegon county have placed an order for two tank carloads, which will be enough for 3 miles of roads. Wexford county is showing great activity, and W. W. Mitchell, of Cadillac, has offered $1,000 bonus for each mile of new road in that county.

Many Want to Join—The motor club now being organized at Marshfield, Wis., will likely be a county club for the Wood county territory. Since the temporary organization was formed the towns of Chili, Granton and nearby towns have become interested, and if they are not taken into the Marshfield club will organize separate clubs, all to become affiliated and joined into a county association.

Lytle Returns from England—Herbert Lytle, who was severely injured at the Indianapolis speedway last spring and who has been spending the last 2 months in England, has returned. While in England Lytle drove a Napier on the Brooklands track, making a speed of 94 miles per hour. He has not decided what car he will drive this season, but is in perfect health.

Shows Trend of Times—The trend of events is probably no better shown than by the want columns of Milwaukee newspapers. Each one now carries daily from three-quarters to one and one-half columns of ads under the head of "For Sale—Horses and Carriages." A year or two ago the "Wanted—Horses and Carriages" column was in the majority, but conditions have changed. The reason for the overwhelming majority of "For Sale" ads is readily discerned in the demand for motor cars.

Sioux Falls' Show Dates—The South Dakota Automobile Dealers' Association has been organized with headquarters at Sioux Falls, S. D., with C. R. Newby as president and F. S. Smith as secretary. The association will hold its first annual show at Sioux Falls, S. D., on April 12-13-14-15. No building in Sioux Falls will hold exhibits of the different dealers and the displays will be held at the different salesrooms of the various dealers in the city. An attractive card will be printed, showing the location of the various exhibits, and these will be distributed among the visitors. Various kinds of contests will be held at different times during the show week to attract and entertain the visitors.

Club at Canonsburg, Pa.—The Canonsburg Automobile Club has been formed at Canonsburg, Pa., with W. H. Richards, president; George W. Hepberg, vice-president; John C. Neil, secretary, and James H. McBurney, treasurer. One of the chief objects of the club will be to keep the highways in that county in good condition.

Picking Road Race Beneficiaries—The question of the beneficiaries of the Fairmount Park road race in the fall of 1911 was gone over at a recent meeting of the board of governors of the Quaker City that the benefits of next autumn's race will be apportioned 50 per cent to the Children's Playground Association, the other half to be distributed equally between the pension funds of the Philadelphia police and park guards.

Show Helps Cleveland Club—During show week more than 700 members were received into the Cleveland Automobile Club, most of whom were unsolicited. The open house meetings that were held throughout show week were so successful that it has been decided to make them a permanent feature. Open house socials will be held at least once a month for members and their wives and friends. A number of social runs are being planned by the runs and tours committee for the coming year.

Good News for Cleveland—Motorists of Cleveland will be able to drive from Cleveland to Akron this summer over a paved road. Summit county commissioners have issued bonds for more than $375,000 to pave with brick the road from Akron to north of Twinsburg. The improvement is a much needed one, as tourists find the road practically impassable at this time of year. There is only about 4 miles of road that will remain unpaved. This strip is in Cuyahoga county, and the Cleveland Automobile Club will urge the commissioners to pave it.

First Quaker Contest of Year—The fourth annual sociability run of the Quaker City Motor Club of Philadelphia, the first of a number of events to be conducted by the club the coming season, on Saturday, April 29, will inaugurate the club's outdoor activity. The run will be from the Hotel Walton, Philadelphia, to Atlantic City, and a novel and attractive route will be mapped out for the tourists and suitable prizes awarded. Official sanction having been obtained from the American Automobile Association, all that remains now is the issuance of the entry blanks.

Legal Lights and Side Lights

SEVERAL OHIO BILLS

A BILL is pending in the Ohio general assembly designed to protect owners of motor cars from people tampering with the engines of the cars. A fine of not less than $200 and imprisonment of not more than 6 months is provided for anyone convicted of tampering with any part of a motor car without the owner's consent.

Another bill is pending in the legislature providing that the term motor vehicle within the meeting of the Ohio law shall include all vehicles propelled by power other than muscular, excepting road rollers, traction engines, fire engines, police patrol wagons, ambulances, and vehicles run upon rails or tracks. This amendment is designed to permit fire engines, ambulances and patrol wagons to use excessive speed and to avoid the necessity of having such vehicles registered under Ohio laws.

A bill was introduced in the Ohio general assembly by Senator Cretone fixing a fine of from $50 to $200 on any car manufacturer, tester, demonstrator or agent who uses the highways for testing or demonstrating their unfinished cars.

DROUGHT BRINGS ABOUT REFORMS

Through the efforts of James T. Drought, counsel for the Milwaukee Automobile Club and the Wisconsin State Automobile Association, as well as special legislative counsel for the city of Milwaukee, a new departure in legislative lobbying has been brought about. The senate and assembly have given their unqualified approval to Mr. Drought's plan for a joint hearing on all bills affecting motor cars, open to all owners, and the mass-meeting will be held about March 23 and 24. Mr. Drought, who is secretary of the Wisconsin State A. A., expects more than 200 owners on the ground, most of them to come in their cars.

The summary of bills affecting motor cars now before the legislature is as follows:

No. 96S, by Senator Klecszka, Milwaukee: To increase motorists' liability in accidents; the fact that injury or death was caused by contributory negligence shall be no bar to recovery of damages. This will be strenuously opposed.

No. 133A, by Assemblyman Bichler, Shawano: To license chauffeur or hired motor driver and providing forfeiture of license as penalty for recklessness; providing annual registration of all cars, fee to be based on horsepower at the rate of 25 cents for each horsepower, with a minimum of $5, with a provision of $20 minimum for dealers and $3 additional for all machines used above four. Number plates to be changed each year in color. A car when sold must bear new certificate on payment of $1; if registered new after August 1 of any year only one-half the fee shall be required. Non-residents exempt if they have complied with laws of their states. This bill is recommended for passage with a request that factory testers be classed as chauffeurs or hired drivers.

No. 314A, by Assemblyman Gilboy: Amending law of speed limitation by providing the additional penalty that a "second or subsequent violation of the present speed law shall be punishable by jail or house of correction sentence of not less than 10 nor more than 60 days." This bill is opposed by the organizations.

No. 191A, by Assemblyman Draper: Providing that towns may call for county aid in road building in amounts equal to those which the towns are prepared to pay. Endorsed.

No. 212A, by Assemblyman Gilboy: Providing for the rebuilding and repair of all culverts in the state to carry at least 18 tons. Endorsed.

No. 55S, by Senator Browne, Waupaca: Providing for the payment of road taxes in cash, and for the removal of snow from roads after 1 day's notice. Endorsed.

No. 315A, by Assemblyman Gilboy: Permitting a duplication of taxes on motor cars by city in addition to that by state. Opposed.

No. 316A, by Assemblyman Gilboy: Providing for the location of tail light to show white light on number and red light to rear and left, and to make it obligatory to keep number plate clean and in readable condition. Approved.

Legislatures Are Active

In the consideration of the Bichler bill regarding registration, the organizations recommend the adoption of the A. L. A. M. formula to determine the horsepower as being the standard, although empirical.

The Milwaukee street sprinkling bill, the chief feature of which is that property owners may be assessed for street oiling as well as water sprinkling, will be amended to include the entire state. There are more than fifteen cities which have undertaken the modern method of laying dust and preserving macadam streets by the use of oil and it is believed to be unfair to permit only the city of Milwaukee to assess abutting property owners for such service.

WANT ROAD TAXES IN CASH

The county highway commissioners of Wisconsin formed a permanent organization at Madison, Wis., last week and memorialized the legislature to pass a bill to require that all county road taxes be paid in cash instead of being worked out, as at present; to give to the state highway commission authority to insure a uniform system of highways throughout the state; to permit the state to build bridges and culverts for small towns and furnish highway material free. The object of having the road or poll tax paid in cash is to obtain improvement in road building. At this time each farmer works on his road for a day or two in lieu of paying the tax in cash. The result is that the roads are worked in a haphazard manner and little good is done.

There is a concensus of opinion in Wisconsin that all road taxes should be paid in money instead of permitting farmers to work out the tax in road building. At the special good roads booster meeting of the Wisconsin Brotherhood of Thresher-resolutions were adopted in this direction. The brotherhood will send a strong lobby to Madison to press the passage of the bill requiring that all bridges and culverts be strengthened to bear a weight of 18 tons. M. W. Torkelson, of the highway division of the Wisconsin Geological Survey, in an address on "Good Roads and Bridges" said it is not necessary to appropriate more money for highway improvement, because the funds now available for this purpose are sufficient if the methods of expenditure are changed to obtain the best possible results. The brotherhood voted to unite with all other forces, notably the motoring organizations, in boosting for highway improvement, and will take steps to join vigorously in a concerted movement.

OHIO STARTS ROAD REFORMS

Senator McGuire has introduced in the general assembly of Ohio a bill which radically reorganizes the Ohio state highway department. The bill is known as senate bill No. 165, and is designed by the author to facilitate good roads building in the Buckeye state. The bill provides for a state highway commissioner to be appointed by the governor, with a salary of $4,000, and three deputy commissioners, having a salary of $3,000 each. The department is to be divided into three bureaus, viz., bureau of construction, bureau of maintenance and repair and bureau of bridges.

Each department is to be in charge of one of the deputy commissioners. Division engineers and assistants also are provided in the bill. The state highway commissioner is to have complete supervision over all highways which have been improved, repaired in whole or in part by state funds. He shall aid the county commissioners to look after road work and shall call a mass meeting at least once a year in each county for the purpose of giving instruction on the best methods of road construction and repair.

He shall prepare a road map of the state from statistics and drawings furnished by the county surveyors of the counties, showing what will be designated as state roads, county roads and township roads, and showing their relative importance. It shall be the duty of the commissioner and his deputies to determine the relative importance of roads with a view of improving systematically.

The law also provides the method by which counties and townships can secure state aid in road building. The author of the bill says that the bill compels each county to apply the state funds to road building instead of using it to reduce taxes, as has been the case in a number of instances.

The Motor Car Repair Shop

OWING to the fact that tightly seated valves are most essential if a smooth running motor is desired, the driver of a motor car should be just as industrious and regular in grinding in the valves of his motor as he should be in brushing his teeth, or perhaps it would be better to say, as he is in eating his meals; for that, perhaps, is his most regular and unneglected duty.

Some drivers are irregular in both the eating of their meals and their attentions to the motor because they are in the employ of families that have not the proper regard for the requirements of either. The employer must be taken to the office—the first thing in the morning; immediately upon the car's return from town the women members of the family use the car until luncheon, after which the car must take them to an afternoon tea, matinee, cards, or a dinner in the park, during which time the driver may or may not get a chance to run home or into a nearby garage and at least give the motor a little needed oil and adjustment before it is time to call for his people.

But to return to the valves. When the valves seat properly the compression is generally good and the motor holds its compression, so that it is capable of delivering its full power when required and starting on the spark without cranking the motor is facilitated. When the valves do not seat properly, compression is not what it should be, and the motor shows a loss of power, starting on the spark is impossible and much cranking is generally required, according to the condition of the valves. In addition to this, when one or more of the valves is particularly in need of adjustment, or repair, misfiring occurs, which is not only very annoying to both the operator and passengers, because of the jerky action of the car and the consequent gloom of a possible breakdown; but the misfiring is often misinterpreted, and both the carburation and ignition systems either are damaged or thrown out of adjustment in an effort to locate the trouble.

Inspect the Valves

Whenever a motor begins to misfire or show a loss of power, the valves should be suspected and inspected first, because they generally are most easily tested. To test the valves of a four-cylinder motor, for instance, one has but to crank the motor over slowly for a few revolutions, carefully feeling the compression at each half revolution. If the resistance is comparatively strong and of an elastic or reactive nature, indicating that the compression is good, and the resistance of each cylinder is equally great, then it is time to suspect the ignition system, or carbureter.

Compression in Motors

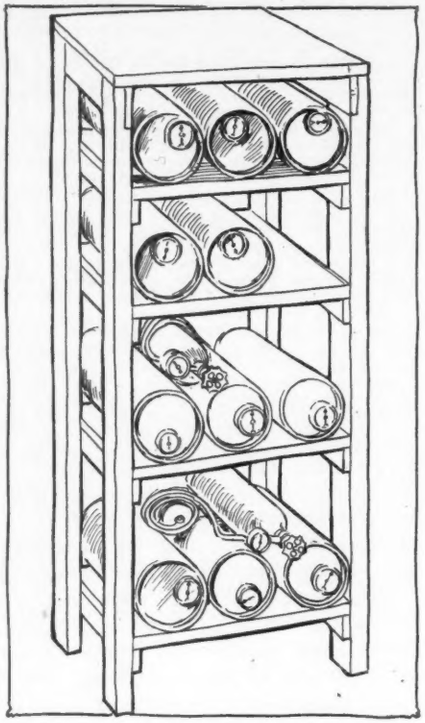


FIG. 1—TANK RACK FOR GARAGES

Should the compression be weak in all of the cylinders, or lacking in its spring-like reaction when pulling up or pushing down the starting crank against the compression, which indicates that the air or gas in the cylinders is allowed to leak out rapidly, then, unless the motor is an old one and the pistons and rings worn or a poor fit in the cylinders, it is a fair indication that the valves need grinding. It does not necessarily mean that all the valves need grinding, for in a T-type motor the intake valves do not become pitted, warped from the heat, or carbonized as readily as the exhausts. It sometimes occurs that the compression is weaker after the valves have been ground in than before; this will happen when the man who grinds the valves neglects to adjust the valve-operating mechanism or to leave about 1/32-inch space between the valve stem and the pushrod or rocker arm.

Should only one or two cylinders show a weakness of compression, locate them by opening the priming cock on No. 1, the front cylinder, and cranking the motor uptil the gas or air begins to blow out; then close it and complete the stroke. Then try the compressions of each cylinder, keeping track of them in their firing order, which may be easily learned by watching the action of either the exhaust or inlet valves.

Having located the cylinders with the faulty compression, see if there is a space of about 1/32 inch between the valve stem and pushrod when the valve is closed, and if all right in this respect remove the exhaust valve, always the exhaust valve first, inspect and grind in if necessary; then replace, adjust the space between valve stem and pushrod, and again try the compression.

If there are any readers of Motor Age who do not know how to grind in a valve, a card to that affect addressed to the editor of Motor Age will bring forth full details of this simple but often abused operation.

Testing the Valves

When a valve has been ground in without the cylinders having been removed from the motor it may be tested in different ways. One way is to make pencil marks across the seat at intervals of ¼ inch apart, then carefully set the valve in place and turn it around about ¼ inch as if in grinding it in, pressing on it lightly with the screwdriver or grinding tool, then remove it carefully and examine the seat; if all of the marks appear to have been rubbed off, or at least blurred, it is a pretty good sign that the valve is seating properly all around. Another way is to put the valve into place, press down on the head of it with the tool and pour a little gasoline around the edge of it. After leaving the gasoline around the edge of the valve for a few seconds, mop it up with a piece of waste, and when it is all removed lift out the valve and see if any of the gasoline has leaked through. If the valve is wet with gasoline under the head, indicating that some has leaked through, it is a fair indication that the valve is not absolutely tight. One should be careful in testing a valve to see that the seats both in the cylinder and on the valve head are properly cleaned.

Rack for Acetyline Tanks

In many repair shops one often sees the acetyline gas tanks and air-bottles lying under a shelf or standing on end in some dark corner of the stock room where, in order to read the gauges at one end of them, it is necessary to take them up and carry them into the light. This should not be. If there are no shelves deep and strong enough for these tanks, a very handy portable rack, such as is shown in Fig. 1, can be built at a moderate cost; and it soon would save its cost, for the handling of the tanks with such a rack is greatly facilitated. The gauges may be read at a glance without the necessity of handling the tanks, which are quite heavy. The rack illustrated was seen in the stock room of the Fletcher Coward, Jr., Automobile Co., of Kansas City, Mo., and is claimed to be a most advantageous contrivance.

Current Motor Car Patents

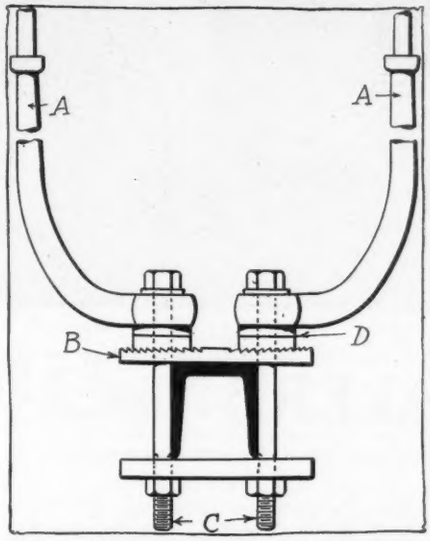


FIG. 1—ADJUSTABLE LAMP BRACKET.

ADJUSTABLE Lamp Bracket—No. 984,813, dated Feb. 21; to G. T. Hilton and F. B. Coppell, Rugby, England—This bracket, Fig. 1, has its two arms A adjustably mounted, by means of a top plate B which has slots through which the vertical bolts C pass. The plate B also is furnished with a series of serrations into which the washers D with corresponding serrations fit. By loosening the nuts on the bolts C and raising the washer D the arms A can be adjusted the desired width of any lamp.

Safety Steering Device—No. 984,960, dated Feb. 21; to F. E. Morey, Baraboo, Wis.—This patent refers to a safety steering device, Fig. 4, which is designed primarily to hold the steering wheels straight to the front in case some part of the steering mechanism should break. The device consists of holding the tie rod T in normal position, by means of two springs, S1 and S1. In the tie rod is a vertical stud S, against each side of which bears a lever L. Whenever the tie rod T is moved to the right or left in turning corners, the movement is against the tension of the springs SI and S1, these springs always being in equilibrium when the tie rod is in the position illustrated, namely, with the road wheels straight ahead.

Storage Battery Separator—No. 985,045, dated Feb. 21; to A. F. Madden, Newark, N. J.—The separator consists of an independent sheet having many parallel and closely spaced slits cut through it, with a portion of the sheet between the slits offset, so as to give greater thickness to the separator.

Radial Plunger Tire—No. 985,112, dated Feb. 21; to L. Conrad, New York—The tire in question is a combination one, Fig. 2, in which are series of radial plungers P, these plungers operating in conjunction with an annular air space A which is formed on one side by the band B on the wheel felloe and on its sides by the ring C which carries the plungers. As the plungers take the carload they are pressed inwards against the air cushion.

A Spring Wheel—No. 984,597, dated Feb. 21; to T. W. Peet, New Britain, Conn. In this spring wheel the outer rim or tire is supported on a series of radial plungers which work in cylinders carried on the wheel proper. Means are provided for furnishing compressed air into these cylinders, so that the elasticity of the wheel can be varied according to the pressure of the air used in the cylinders.

Demountable Rim—No. 984,933, dated Feb. 21; to P. J. McCollough, St. Louis, Mo.—In this demountable rim the circumference of the rim is so much greater than the circumference of the fixed rim on the wheel felloe that the demountable rim is spaced away from the major portion of the fixed rim, when in operative position. There are rings on one side of the demountable that enter grooves in the fixed rim when the demountable is slipped on; these rings being adapted to ride out of the grooves and up onto the surface when the rim is in operative position.

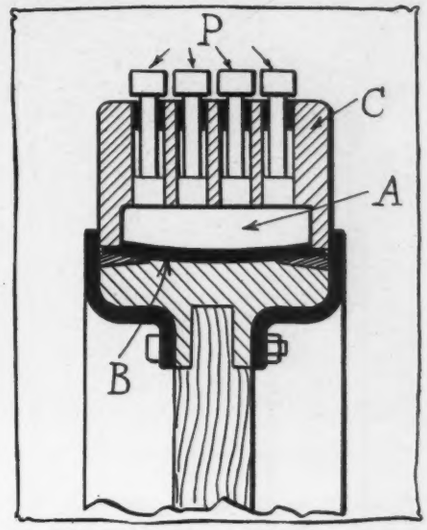


FIG. 2—RADIAL PLUNGER TIRE

Cam Wrench Mechanism—No. 985,028, dated Feb. 21; to E. Green, San Marcos, Tex.—This patent relates to a monkey wrench, illustrated in Fig. 3. The movable jaw J carries a cam lever C which is adapted to engage in the serrations S on the shank of the wrench in order to hold the jaw J in any position. The cam lever C is operated by an eccentric, located within the jaw J. The eccentric is operated by a screw which projects beyond one side of the jaw J.

Storm Curtain Door—No. 985,105, dated Feb. 21; to C. C. Balckmore, Cincinnati, O.—The storm curtain door is an invention for a motor car in which the side storm curtain is supported on the tonneau door, so that when the door is open that part of the curtain above it swings open with it. This is made possible by securing an upright to the door of the car, which upright is capable of being bent to conform with the contour of the top bow sockets.

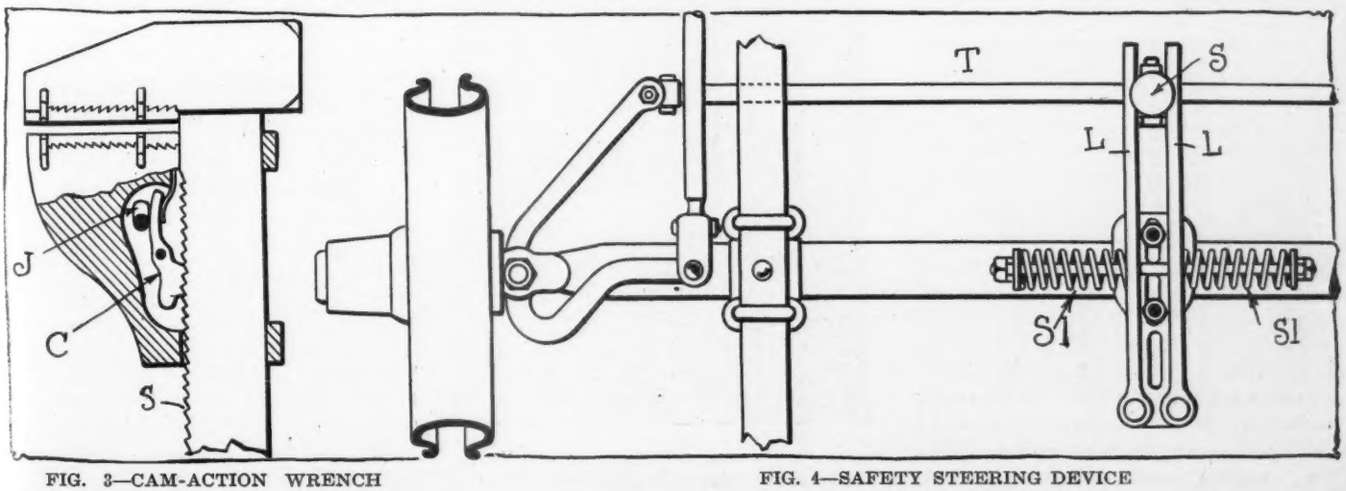
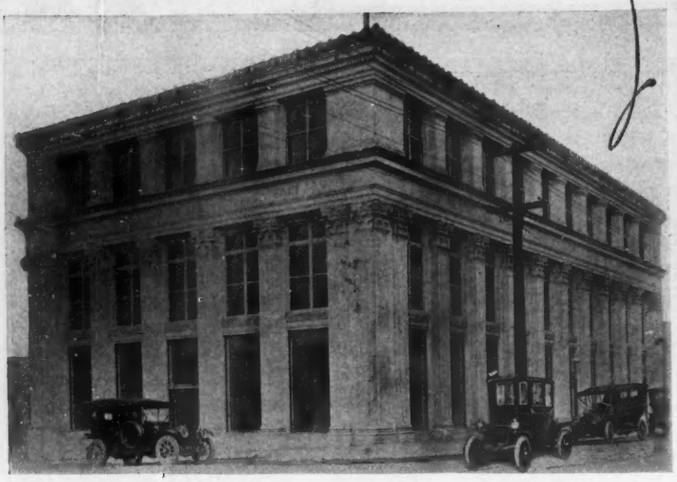
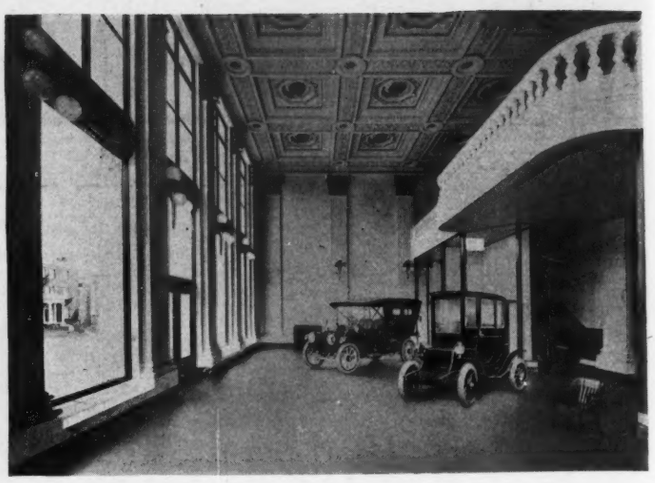


FIG. 3—CAM-ACTION WRENCH

FIG. 4—SAFETY STEERING DEVICE

AMONG the MAKERS and DEALERS





EXTERIOR AND INTERIOR OF CUYLER LEE'S SALESROOMS, SAN FRANCISCO, HANDLING PACKARD AND WAVERLEY

BRETZ Again Agent—The J. S. Bretz Co., of New York, announces that after a lapse of a year it is again the sole selling agent of the product of the Hartford Auto Parts Co., of Hartford, Conn.

Garage Changes Hands—The Highland garage, Twenty-seventh and State streets, Milwaukee, has changed hands and is now known as the Boulevard garage. Arthur F. Tiegs is sales manager, representing the Halladay.

Another Stromberg Branch—The Stromberg Motor Devices Co., of Chicago, has opened a branch in Minneapolis, in charge of Harvey Goodwin, who for 2 years previous to that time was in charge of the Boston branch.

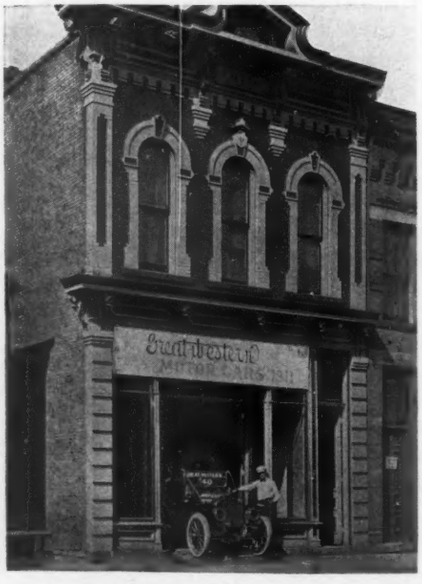
Allison in Charge—By an arrangement made with the creditors of the Penn-Unit Car Co., who are located in Allentown, Pa., it was decided to ask H. W. Allison, general manager of the Allentown Rolling Mills, to assume control of the company and its assets. Mr. Allison has accepted the proposition, and from now on will be at the head of affairs.

Change at Lansing—A. S. Bennett, secretary and manager of the Peerless Motor Co., of Lansing, Mich., for 8 years, has resigned his position to become secretary and manager for the United Manufacturers' Association of Jackson, Mich., which was organized in 1910 to market with dealers the products of several companies which manufacture gasoline engines and accessories.

Big Case Shipment—One of the J. I. Case Machine Co.'s shipments of machinery by the trainload with its own locomotive and schedule left Racine, Wis., last week for Oklahoma City, but it differed from previous immense shipments not only in size but in goods. This time it included eleven cars of Case motor cars, the remaining twenty cars containing farm machinery, engines and threshers. Another trainload of machinery, the majority of cars to contain Case motors, will be shipped later in the year. The Case company has a large branch at Oklahoma City.

Recovers From Fire—The Chicago School of Motoring, of which F. E. Edwards is instructor, is once more in operation. The school is located at 1619 Michigan avenue, Chicago, in the building which was badly damaged by fire recently. The damage to the school was slight.

Going to Findlay—L. E. Ewing, president of the Findlay Motor Co., has closed a contract with the Lockport Stamping Co., of Lockport, N. Y., for the removal of the latter plant to Findlay, O., and consolidate the same with the Findlay Motor Co. The deal has been pending for several months. The work of dismantling the Lockport factory will begin at once and its removal to Findlay will be made as speedily as possible. The capital stock of the Findlay Motor Co. has been increased from $300,000 to $400,000.



MAU AUTOMOBILE CO., MILWAUKEE, HANDLING GREAT WESTERN

Bloomington's New Garage—C. U. Williams & Son, of Bloomington, Ill., are now occupying a new building, the dimensions of which are 75 feet by 125 feet, and four stories high. It is of concrete and steel construction. The building was planned by a Blomington architect, built by a Bloomington contractor, and entirely from material made in Bloomington. The concern handles the Chalmers.

More Thomas Appointments — George Fitz-Simons has been appointed sales manager of the E. R. Thomas Motor Car Co. to succeed W. H. Van Deusen, resigned. For the past year he has been the Packard dealer in Atlanta, Ga. Edward Wells, for 2 years assistant to Mr. Van Deusen, acquires the title of assistant sales manager. C. R. Frede has joined the company as manager of the specification department.

Take Abbott in New York—L. A. Hopkins, for the past year manager of the Centaur Motor Co., of Buffalo, N. Y., state distributor of the Olds and Oakland line, has identified himself with W. J. Botta, and will open a retail salesroom on Broadway, near Fifty-second street, New York City, for sale of the Abbott-Detroit. The new concern will be known as the Abbott-Detroit Co. of New York, and will represent the Abbott line in New York state, New Jersey and Connecticut.

Connecticut Opens New Branches—The Connecticut Telephone and Electric Co., of Meriden, Conn., has opened a new branch in connection with the E. J. Edmond Co., 1783 Broadway, New York, where a line of Connecticut ignition products and shock absorbers will be kept on hand to supply the New York trade. A factory branch has also been opened in Chicago, and a Philadelphia and Boston branch will soon be opened. Pacific coast trade will be taken care of by Hughson

& Merton, with main office at San Francisco, and with branches at Los Angeles, Portland and Seattle. Representatives are also being appointed in London, Paris, and Berlin, Germany.

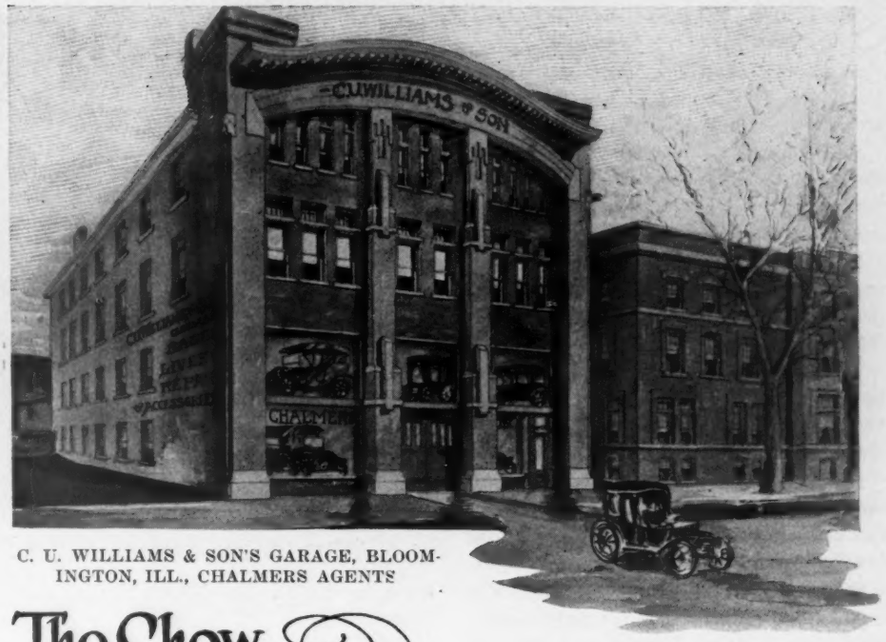
A San Francisco Salesroom—One of the finest salesrooms and garages in the country is said to be that belonging to Cuyler Lee, the San Francisco representative of the Packard gasoline car and the Waverley electric.

Corl Heads Repair Plant—J. F. Corl, formerly identified with the piano manufacturing business at Battle Creek, Mich., has been placed at the head of the Rapid plant in Pontiac, Mich., to succeed George A. Horner, who takes the place made vacant by the death of General Manager H. G. Hamilton.

Brock Out of Cab Business—Marcus I. Brock, vice-president and manager for the past 2 years of the Thomas Motor Cab Co., found it necessary in the early part of the current year to offer his resignation, to take effect the end of February, because of an urgent need of absolute rest and temporary freedom from business cares. Mr. Brock will spend the next 2 months at his home at Wayne, Pa., enjoying a vacation.

Will Make Trucks—D. F. Poyer & Co., of Menominee, Mich., have leased larger quarters in the Ramsay-Jones building and will begin the manufacture of motor trucks. For the present the product will be confined to the light type, of 1,000 to 1,500 pounds capacity. The leading stockholders are D. F. Poyer and W. S. Carpenter, who is president of the Lumberman's National Bank of Menominee. The cars will be known as the Menominee.

Everitt Appointments—C. R. Teaboldt Co., 1597 Broadway, New York city, has been appointed eastern factory representative for the Everitt. The American Automobile Co., 561-563 Boylston street, Boston, Mass., has been appointed factory representative of the Everitt in Boston and the surrounding counties in Massachusetts. The Metzger Motor Car Co. also reports the recent appointment of the following direct factory agents: Central Garage and Sales Co., New Brunswick, N. J.; Gamble Motor Car Co., Toledo, Ohio, and Cordner-Whitaker Co., Springfield, Mass.



C. U. WILLIAMS & SON'S GARAGE, BLOOMINGTON, ILL., CHALMERS AGENTS

The Show Circuit

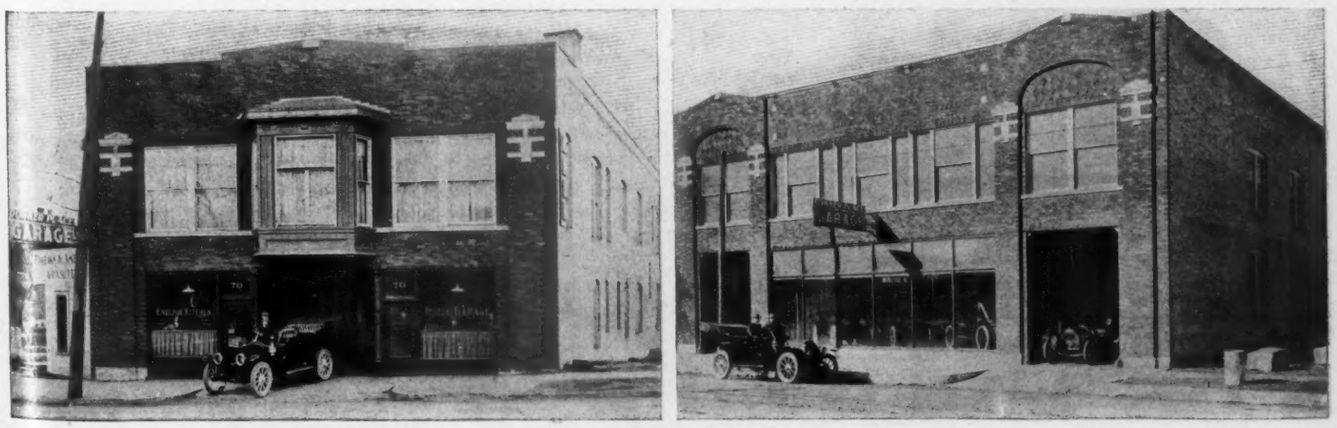
March 4-11—Show at Boston, Mass.
March 4-11—Show at San Francisco, Cal.
March 6-11—Show at Des Moines, Ia.
March 13-18—Show at Cedar Rapids, Ia.
March 14-18—Show at Syracuse, N.Y.
March 14-18—Show in Auditorium, Denver, Colo.
March 18-25—Show in Pittsburg, Pa.
March 15-18—Show at Louisville, Ky.
March 20-26—Mississippi Valley show, Quincy, Ill.
March 25-April 1—Show of Pittsburg Automobile Dealers' Association, Pittsburg, Pa.
March 18-25—Show at Montreal, Quebec.
April 12-15—Show at Sioux Falls, S. D.
April 4-8—Commercial Car Automobile Dealers' Association show of Pittsburg, Pa.

Aurora's Newest Garage—The Downer Place garage is the newest motor establishment in Aurora, Ill., occupying a pretentious establishment with 20,000 square feet of floor space. The building not only has a repair shop and rest rooms, but it also maintains a cafe for the convenience of its patrons. The Stearns, Cadillac and Brush are handled.

Montreal—Canadian Motors, Limited, Galt, Ont., is manufacturing the Canada roadster, a four-cylinder car. The Matthew Guy Carriage and Automobile Co., Ltd., Oshawa, Ont., is putting a car on the market called the Guy 30.

Percival, Abbott Publicity Man—Dr. Charles G. Percival has actively connected himself with the Abbott Motor Co. as director of publicity. Dr. Percival is the originator of the 100,000-mile durability run of the Abbott-Detroit Bull Dog.

Fulton Makes a Change—John Fulton has sold to L. P. Zinke his entire holdings in the Fulton-Zinke Co., of Chicago, retaining, however, the accounts of the Victor Lamp Co., of Cincinnati, and the Jeffery-Dewitt Co., of Detroit. Mr. Fulton has associated with him Fred W. Grubb, formerly of the Excelsior Supply Co., and the new combination is known as the Fulton-Grubb Co.



TWO ENTRANCES TO THE DOWNER'S PLACE GARAGE IN AURORA, ILL.

Brief Business

ST. LOUIS, MO.—S. C. Igou has taken the agency for the Bergdoll.

St. Louis, Mo.—The Park Automobile Co. has become the agent for the Morgan truck.

Baltimore, Md.—The Model Automobile Co. has opened up here with the agency for the Everitt. The store is on Lovegrove street.

Baltimore, Md.—The Lord Baltimore car is in the hands of the Lord Baltimore Auto Co., which has been recently organized in this city.

St. Louis, Mo.—The Whitman Motor Car Co., 4144 Olive street, has become the agent for the Van, and will also handle the Federal truck.

Philadelphia, Pa.—The Interstate Motor Co., which recently underwent reorganization, now occupies its new quarters at 514-516 North Broad street.

Platteville, Wis.—The Acme Auto and Garage Co. has been incorporated for $10,000. John Kettler, Warren L. Torne and Frank T. Goodell are the promoters.

Hartford, Conn.—The Buick Garage Co. has been named as the local agent of the Rapid trucks, the agency having been secured through the T. M. Russell Co., of Middletown.

Pittsburg, Pa.—The General Automobile Co., of Pittsburg, capital $10,000, has received a Pennsylvania charter and will be open for business shortly. The incorporators are Harry Silverman, Aaron DeRoy and E. A. Barchfield, of Pittsburg.

Milwaukee, Wis.—The Wambold Mfg. Co., 3009-3021 Lisbon avenue, brass founder and machine builder, has increased the capital stock from $30,000 to $50,000 to cover the extension of the business into the motor car and marine engine field.

Kansas City, Mo.—P. P. Covert, agent for the Inter-State, will open a new salesroom and garage at the corner of Eleventh and Locust streets. The new building is three stories, of brick and concrete construction, 100 by 145 feet. Mr. Covert has taken on the Van in addition to the Inter-State.

GARAGE OF THE PIONEER MOTOR CAR CO., OF MUSKOGEE, OKLAHOMA

Baltimore, Md.—Another car being handled by the Auto Outing Co. here is the Welch-Detroit.

Baltimore, Md.—The Simplex is one of the newcomers in Baltimore. It is being handled by the firm of J. M. Quinby & Co.

Columbus, O.—The Adamson Automobile Co., 17 West Mound street, has taken the central Ohio agency for the Sampson.

Baltimore, Md.—The State garage at North avenue and Oak street has been discontinued. The Washington car was handled by this firm.

Madison, Wis.—Meier Brothers have moved into their new garage on East Main street. In addition to the Pullman, the firm has taken on the Maxwell, Sampson and Alden Sampson truck.

Detroit, Mich.—M. M. Baker & Co., with branch salesrooms at Louisville, Ky., Peoria and St. Louis, Mo., has taken on the Abbott-Detroit for central and southern Illinois, eastern Missouri, and Kentucky, and will handle this line in conjunction with the Baker electric and the Alco pleasure car.

Baltimore, Md.—Rice Brothers, North and Madison avenues, have just taken the agency for the S. G. V.

Kirkpatrick, Ind.—The Grimes-Gray Auto Co., just organized, will handle the Overland, Stoddard-Dayton and Empire.

Hartford, Conn.—Clarence S. Payne has secured the agency of the Palmer & Singer cars for Hartford, Tolland, Windham and Litchfield counties.

Indianapolis, Ind.—The State Automobile Co., Indiana distributor for the Reo, has closed a contract to also distribute the Moon in Indiana this season.

Jefferson, Wis.—Frank Hoefs, of Appleton, Wis., has purchased the interest of William Wagner and Frank Lamach in the Jefferson Auto Supply Co., of this city, and will conduct the business.

Pittsburg, Pa.—Thomas Pepperday has been elected sales manager for J. M. Quinby & Co., whose headquarters are on Grant boulevard. He will handle the Simplex and also a landaulet body for the Quinby people.

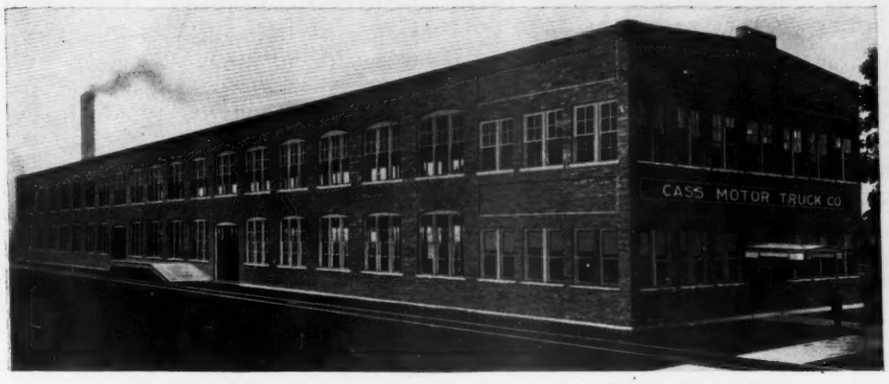
St. Louis, Mo.—The Igou Motor Car Co. has opened quarters at Grand and Cass avenues. Samuel C. Igou, formerly superintendent for the Moon Motor Car Co., is president of the new concern, which will act as distributor for the Bergdoll line.

Tomahawk, Wis.—G. E. Roberts and E. G. Oelhafen have opened a garage and have been appointed northern Wisconsin distributors for the Curtis Auto Co., Milwaukee, state agent for the Reo, Corbin and Owen. The firm name is the Roberts & Oelhafen Motor Car Co.

Des Moines, Ia.—The Ideal Auto Co. has taken the agency in Des Moines for the Warren-Detroit, formerly held by the Brown-Williams Auto Co. Another car which is taken on here for the first time is the Knox, which will be handled by the Standard Auto Co., a new concern. In

POWELL'S GARAGE, CORDELE, GA., HANDLING THE OLDSMOBILE

Announcements



FACTORY OF THE CASS MOTOR TRUCK CO. AT PORT HURON, MICH.

addition to the Knox, the company will handle the Paterson.

Baltimore, Md.—The agency in Baltimore for the Inter-State has been placed with the Kellar Auto Co.

Baltimore, Md.—The Abbott-Detroit Motor Car Co. has been organized here to handle the Abbott-Detroit and Krit cars.

Fond du Lac, Wis.—W. F. Raidy, 299 Fourth street, has been appointed district agent for the Overland and has leased display room in the Clancy block.

St. Louis, Mo.—The Fireball Gas Tank and Illuminating Co. has established a factory at 5010 Delmar boulevard to manufacture gas tanks for motor cars.

Indianapolis, Ind.—Charles D. Bell, a factory representative, has arrived in Indianapolis and has opened headquarters for the Welch-Detroit with the Buick Motor Co.

Philadelphia, Pa.—Charles Howard, general manager of the Boulevard Garage Co., 1536-40 Race street, has just secured the agency for the Mercedes cars in Pennsylvania, Maryland and Delaware.

Milwaukee, Wis.—The Rhode Automobile Co., which has been operating a garage at 1621-1623 Wells street, has filed articles of incorporation. The capital stock is $25,000 and the incorporators are Sidney Knowlton, Albert Rohde and John J. Rohde.

Sioux City, Ia.—The W. L. Huffman Auto Co., of Omaha, has established a branch office at Sixth and Douglas streets in this city. The company will handle the Hupmobile and the Hupp-Yeats electric. R. A. DeWitt, of Omaha, will be in charge of the new firm.

Toledo, O.—E. W. K. Burg, who recently took over the agency of the Hupp-Yeates electric for this territory, has secured new and commodious salesrooms at 1006-1008 Madison avenue, in the quarters formerly occupied by the Speedwell cars. The concern has heretofore made its headquarters in the salesrooms of the Toledo Auto and Garage Co.

Columbus, O.—The Warren & Southwick Co., of Cleveland, O., has taken the central Ohio agency for the Cutting.

Hartford, Conn.—The Westcott car is being sold in Hartford county by the Hart-Heimgartner Auto Sales Co.

Baltimore, Md.—The Oldsmobile is being represented in the Monumental City by C. R. Mizner, whose headquarters are in the Griffin's garage.

Omaha, Neb.—Blaine Young has secured the agency for the Premier for Nebraska and Iowa. For the time being, his office is in the Barker block.

Baltimore, Md.—Two new trucks in Baltimore are the Frayer-Miller and the Kelly. The local agent is J. L. B. Wilhide, who has a garage on Argyle avenue.

Cleveland, O.—The Reo will be sold in Cleveland during 1911 through a branch house located on Euclid avenue, with Ed De Gollier as manager. For the past few years De Gollier has been connected with the Olds-Oakland Co. as salesman. He will control the Reo and Owen cars through the state.

Paw Paw, Mich.—Harry Nash has purchased the building formerly used as a canning factory and will establish a garage.

Aspinwall, Pa.—The Aspinwall Automobile and Garage Co. has opened a sales garage and repair department on Freeport street.

Baltimore, Md.—The Garford is being handled in Baltimore by the Dixon C. Walker Automobile Co., Charles and Twentieth streets.

Milwaukee, Wis.—R. D. Rockstead, 803 Grand avenue, state distributor for the Warren-Detroit, has been made state representative for the Paige-Detroit.

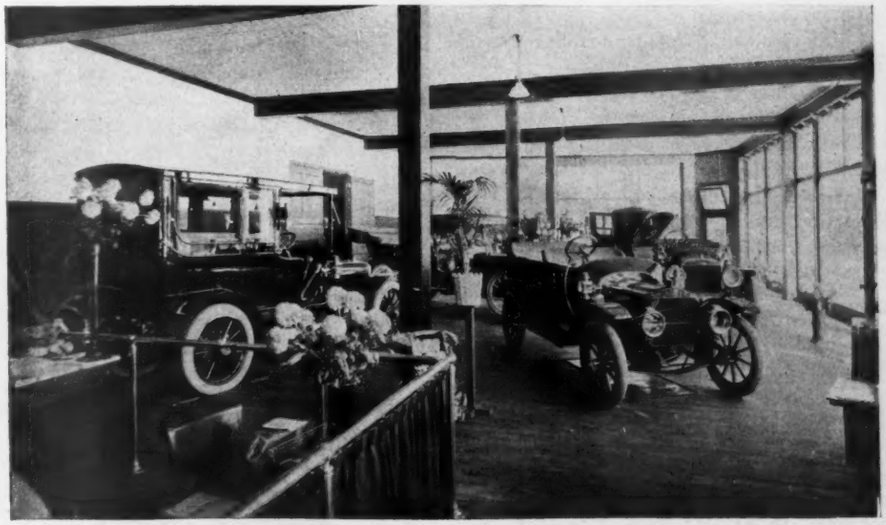
Hartford, Conn.—Eldred W. Clark has been appointed agent for the Selden car. He will be the distributor for Hartford, Litchfield, Tolland and Windham counties.

Port Huron, Mich.—The garage on East Water street, formerly conducted by P. C. Greiner, has been sold to William A. Ludlow and George Riley. The Buick car will be handled.

Hartford, Conn.—Mansury & Smith, carriage dealers, have taken the agency for the Abbott-Detroit and have changed their carriage repository at 19 and 21 Elm street over into a motor car salesroom.

Des Moines, Ia.—The Brown-Corley-Ellis Automobile Co. is the name of a new concern which has recently opened a business here. The company has taken on the Paige-Detroit, a new car here, and also will handle the Marmon and Warren-Detroit.

Milwaukee, Wis.—The Milwaukee Mfg. Co. has absorbed the Monarch Motor Co. and moved to the new building at 155-157 Lincoln avenue, Bay View, Milwaukee. George V. Hanley is general manager, and John A. Surges has been appointed superintendent of the electrical department of the Milwaukee company.



INTERIOR OF R. E. BROWN MOTOR CAR CO., BUFFALO, N. Y.

Theory and Design of Leaf Springs

Laws Governing the Strength of Springs Analyzed—Analysis of Suitable Spring Materials Given—Necessity of Careful Heat Treatment—Spring Dimensions Necessary in the Motor Car Field — When Stock Absorbers become Necessary

By E. R. Rowland

EDITOR'S NOTE—Paper on Leaf Springs read before the annual meeting of the Society of Automobile Engineers, New York, January 11 and 12, 1911.

THE object for which vehicle springs are used is first and mainly to prevent shocks which arise from irregularities of road surfaces from reaching the passengers; secondly, to prevent damage to the vehicle. The modern spring dates from 1804, when a patent covering elliptic springs was granted Obadiah Elliot.

Until the advent of the motor car the vehicle spring was divided, roughly speaking, into those for passenger carriages and those for transportation of merchandise, the main requisite of the first being ease of riding and of the second strength. When the motor car became a commercial possibility the demand arose for springs combining ease and strength, which demand the spring-maker has endeavored to supply with more or less success.

Strength, Deflection and Resilience

The laws relating to the strength, deflection and resilience of springs are as follows:

The strength of a spring varies—

1—Directly as the breadth of its plates. That is, double the breadth and you double the strength;

2—As the square of the thickness of its plates. That is, double the thickness and you increase the strength four times;

3—Inversely as its length. That is, double the length and you halve the strength;

4—Directly as the number of plates. That is, the plates being all the same thickness, the strength of the spring is the strength of its main plate multiplied by the number of its plates.

The deflection of a spring plate under the load it will bear without taking a permanent set varies—

5—As the square of its length. That is, double the length and you increase the deflection four times;

6—Inversely as its thickness. That is, double the thickness and you halve the possible deflection;

7—As the load. That is, double the load and you double the deflection.

The resilience of a spring varies—

8—Directly as its weight or volume.

The rate at which a spring oscillates under any safe load varies—

9—Inversely as the square root of the deflection produced by that load, or, for a given spring, inversely as the square root of the load.

Design of Springs

Using the well-known formulæ of Reauleaux a spring may be constructed to carry with safety any given load, but at this point spring designing ceases to be a science and becomes an art, for the reason that the features of construction which produce ease of riding are covered by no formula; under this head I include the number of plates, their thickness and length, the length of the taper of each plate and resilience.

If one endeavors to check up the majority of motor springs in use it will be found that these obvious laws and standard formulæ are more honored in the breach than in the observance and that resilience is almost universally neglected as a factor in designing.

Material for Springs

Assuming that a spring has been properly designed, the selection of proper material is of great importance, and the spring-maker is limited to three materials, chrome-vanadium, silico-manganese and what, for want of a better name, may be called open-hearth steel of the standard French analysis, of which the following is the composition:

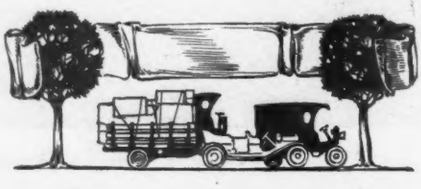
Carbon	.60
Manganese	.70
Sulphur	.025 to .04
Phosphorus	.07
Silicon	.20% to .30%

Any of these materials properly heated possesses to a marked degree the necessary qualifications of a good spring steel, that is, high tensile and elastic limits with great elongation and reduction. Of these steels I unhesitatingly recommend chrome-vanadium as vastly superior to the other two, silico-manganese being a fairly good second, the greatest point of superiority in chrome-vanadium lying in its great resistance to fatigue.

I have not included chrome-nickel as a suitable material on account of its well-known inability to stand up in service.

Heat Treatment Necessary

Admitting that proper design and material have been secured, a good spring cannot be made unless the heat treatment is correct and this can only be secured by the proper use of pyrometers, which must be frequently calibrated and checked.



In connection with the manufacture of springs the heat treatment is of the utmost importance. Plain carbon steel properly heat-treated will give splendid results if the spring be properly designed, and, more important yet, properly attached to the axle. Any spring that is not properly attached to the axle will give trouble by breakage.

The treatment of steel by spring-makers at this time is, as a rule, bad. Old and inexact methods good enough for horse vehicles are still in vogue, and they are of such a character as not to create any uniformity of physical condition in the several leaves of the spring. In some cases the physical condition of the metal is different in the various parts of the length of a given leaf. This condition should not exist in a spring any more than in a transmission gear. The difficulty is that a spring is long and thin, rendering it difficult to have all parts of the length uniformly heated or uniformly cooled. There are, however, manufacturers who actually secure uniformity between the various leaves and in any one leaf. To do so old methods are departed from.

The remedy is that the manufacturer must select those companies who do treat the steel properly.

Specification of Spring

As an example of spring design I submit the following specifications for a standard seven-passenger touring car weighing between 3,750 pounds to 4,000 pounds. The dimensions given in all cases are under load.

Front Springs—2¼ inches wide, 38 inches long; the right spring to be of 150 pounds greater capacity than the left, as it has to take the torque of the motor.

Rear Springs—Three-quarter scroll elliptic 2¼ inches or 2½ inches wide, the lower member to be 52 inches long, off-centered, not over 2 inches and to have an inside opening of not over 2 inches; the top member to be from 20 inches to 22 inches to center.

Spring Seats—In seating the springs on the axle I strongly recommend a soft metal seat, although it is possible to obtain good results by the use of a leather pad not exceeding ¼-inch in thickness; heavier leather or wood has a tendency to crush in service, increasing breakage.

Spring Clips—The spring clips should be of ample size and of a better material than ordinarily used. And the importance of keeping the clips tight cannot be overestimated. This last fact should be impressed on the purchaser of a car and he should be advised that at intervals of two to three months the springs should be lubricated between the leaves.

Use of Shock Absorbers

On the question of shock absorbers I am hardly competent to express an opinion. My experience as a driver of motors, which covers a period of 6 years and includes extensive touring in this country and abroad, leads me to believe that with correctly constructed springs shock absorbers are not a necessity, although I am inclined to believe that they can be used to advantage with improperly designed springs where extreme speed is to be developed or where extra hard service is expected of the car.